A. Tschirch.

1948

THE AMERICAN
JOURNAL OF PHARMACY

JANUARY, 1906.

LONDON BOTANIC GARDENS.

By Pierre Élie Félix Perrédès, B.Sc., F.L.S.,
Pharmaceutical Chemist.
A Contribution from the Wellcome Research Laboratories, London.

(*Continued from p. 569, December, 1905.*)

Before proceeding with the description of the Arboretum and Botanic Gardens a few additional historical facts connected with these will be noted. The Botanic Gardens, at the time of Sir Wm. Hooker's appointment to the directorate, included the remains of an old Arboretum which had been begun from 70 to 80 years previously. The disintegration of that Arboretum dates from 1830, when the boundary wall dividing the gardens from the public road leading to Brentford Ferry was removed. As the trees were thus deprived of the protection which this wall had afforded, many of them were blown down, others have since perished from old age and decay, and the few remaining ones, growing near the main entrance on Kew Green, are of no interest to us.

One the most, if not the most, considerable collection of trees is the Pinetum, brought to its present high level of excellence by the former Director, Sir J. D. Hooker. It surrounds the nursery on the south side of the lake, skirts the Queen's Cottage grounds on its western boundary, and is traversed by a grass walk known as the "Cedar Vista" (see Plate I). The collection contains a large number of American conifers, and the plants are so arranged that the Old World species are placed opposite to the American species of the same genera.

Here are to be found the poisonous yew (*Taxus baccata*, L.) and its varieties; the four junipers yielding products used in medicine, viz.: *Juniperus*

Sabina, L., or savin, and the red cedar (*Juniperus Virginiana*, L.), from which an analogous drug is obtained, *Juniperus communis*, L., from which the juniper berries and oil of juniper of commerce are derived, and *Juniperus Oxycedrus*, L., from the wood of which, and probably from that of other species, "*Huile de Cade*" is prepared by destructive distillation; the common spruce (*Picea excelsa*, Link.), and its numerous varieties, from which Burgundy pitch is collected by making incisions into the wood; the larch (*Larix Europœa*, DC.), whose bark is occasionally used in medicine, and on which grows the white agaric of Continental Pharmacopœias, it is also the source of Venice turpentine; *Abies balsamea*, Mill., the "Balsam Fir" or "Balm of Gilead," from which Canada turpentine or Canada balsam is obtained by incision; *Pinus Laricio*, Poir., and varieties, *Pinus sylvestris*, L., *Pinus Pinaster*, Soland., and others, from which European turpentine and Galipot are obtained; and the North American species, *Pinus palustris*, Mill., *Pinus Tæda*, L., etc., which are the sources of most of the resin of commerce, of American turpentine, and of common frankincense.

On the east of the Pinetum, and flanking the Pagoda Vista (see Plate I) on each side, the collections consist mostly of shrubs, as, for instance, representatives of the genera *Berberis*, *Rhus*, *Rubus*, *Cratægus*, *Rhamnus*, etc., while on the north of the lake and Pinetum, and west of the Botanic Gardens, the collections consist mostly of trees, such as oaks, chestnuts, elms and poplars. The willows, with the exception of the alpine species, are grown on the borders of the lake.

Among the many plants of interest to the pharmacist in these sections of the Arboretum are the following: *Berberis aquifolium*, Pursh., *B. nervosa*, Pursh., and *B. repens*, Lindl., sources of Oregon grape root; *Berberis vulgaris*, L., and its numerous forms and varieties, from which the barberry bark of herbalists is obtained; *Tilia heterophylla*, Vent., and *T. platyphyllos*, Scop., whose inflorescences with attached bracts, known as "Linden Blooms" (French, "*Fleurs de Tilleul*") have long been used on the Continent in the form of infusion; *Xanthoxylum Americanum*, Mill., one of the species yielding the prickly ash bark of the U.S.P.; *Rhamnus Californicus*, Eschsch., the source of the "*Cascara Sagrada*," or Sacred Bark, of the Spanish settlers in California; *R. Purshianus*, DC., from which the drug of commerce is derived, and *R. Frangula*, L., and *R. catharticus*, L., Old World species yielding respectively alder buckthorn bark and buckthorn berries ("*Fruits de Nerprun*" of the French Codex); *Rhus glabra*, L., the sumach whose fruits are official in the U.S.P.; *Rhus toxicodendron*, L., or poison oak; *Pistacia Lentiscus*, L., from which gum mastich is collected; *Cytisus scoparius*, L., or broom; *Robinia Pseudacacia*, L., from the bark of which a poisonous proteid has been extracted; *Cassia Marylandica*, L., the "Wild American Senna," with leaves resembling Suez senna from *Cassia obovata*, Collad.; *Prunus amygdalus*, Stokes, or almond tree, and *P. communis*, Hudson, cultivated for their seed-kernels and fruits respectively, as also *Prunus Laurocerasus*, L., for its leaves, whilst *P.*

PLATE XI.

THE LAKE IN THE ARBORETUM, KEW GARDENS.

serotina Ehrh. yields the wild cherry or Virginian prune bark of the pharmacopœias; the three representatives of the genus *Rosa*, *R. canina*, L. (and its numerous varieties), *R. damascena*, Miller, and *R. Gallica*, L., sources respectively of otto of rose, hips and red-rose petals; *Cydonia vulgaris*, Pers., represented in pharmacy by its mucilaginous seeds; *Hamamelis Virginica*, L., whose leaves and bark both figure in the British Pharmacopœia; *Sambucus Canadensis*, L., *S. nigra*, L., and varieties, whose flowers are used for the preparation of elder-flower water; *Viburnum opulus*, L., the source of cramp-bark; *Arctostaphylos Uva-ursi*, Spreng., or bearberry, whose leaves are official in most pharmacopœias, and *Gaultheria procumbens*, L., of the same family, from the leaves of which oil of wintergreen is distilled; *Fraxinus Ornus*, L., the manna ash; *Solanum Dulcamara*, L., whose stems were still retained in the U.S.P. of 1890; *Rosmarinus officinalis*, L., or rosemary; *Sassafras officinale*, Nees, well known for the fragrant bark and wood of its root; *Ulmus compestris*, L., the common elm of the Old World, and the American slippery elm (*Ulmus fulva*, Mich.), both represented in commerce by their barks; *Juglans cinerea*, L., the American "Butternut"; *Betula lenta*, L., from whose bark is distilled an oil which is closely related to oil of wintergreen; *Quercus alba*, L., *Q. pedunculata*, Ehrh., and its numerous varieties, yielding astringent barks, and *Q. Suber*, L., the cork oak; *Castanea dentata*, Borkh., whose leaves are used for the preparation of a fluid extract; *Smilax China*, L., formerly used for its root, now almost entirely supplanted by sarsaparilla; *Salix alba*, L., *S. discolor*, Muhl., *S. fragilis*, L., *S. nigra*, Marsh., *S. purpurea*, L., and *S. rubra*, Huds., in the collection of willows, which have all at some time claimed the pharmacist's attention.

The hardy herbaceous plants are grown in the Herbaceous Ground, which is situated on the northeastern corner of the Botanic Gardens, between the Jodrell Laboratory and the Cumberland Gate, and bounded on the east by the Richmond Road and on the west by the Rock Garden. The plants are set out in parallel beds and are arranged according to their natural orders, Bentham and Hooker's classification being followed. There is also a separate collection of hardy medicinal plants in this section, but this will be considered together with the general collection. As the number of plants in this collection is very large, it will only be necessary to select a few natural orders to indicate its scope, and the following six will, accordingly, be briefly dealt with: *Ranunculaceæ*, *Papaveraceæ*, *Umbelliferæ*, *Compositæ*, *Solanaceæ*, and *Liliaceæ*.

RANUNCULACEÆ.—*Aconitum Napellus*, L., the official aconite, *A. ferox*, Wall., Indian Bish, and *A. Fischeri*, Reichb., Japanese aconite; *Adonis æstivalis*, L., *A. autumnalis*, L., and *A. vernalis*, L., all recognized by the Italian Pharmacopœia; *Anemone Hepatica*, L., a North American species occasionally used in decoction, and *A. pratensis*, L., and *A. Pulsatilla*, L., the pulsatilla of the homeopaths; *Cimicifuga racemosa*, L., the North American

black snakeroot; the bitter tonic goldthread (*Coptis trifolia*, Salisb.), containing berberine; *Delphinium Consolida.*, L., yielding acrid seeds, and the better-known *D. Staphisagria*, L., the source of stavesacre seeds of commerce; *Helleborus niger*, L., the black hellebore or Christmas Rose; *Hydrastis Canadensis*, L., or golden seal; *Nigella Damascena*, L., and *Nigella sativa*, L., with acrid seeds now rarely used; *Ranunculus Ficaria*, L., the pilewort, whose roots were used by the old herbalists to cure hemorrhoids by signature.

PAPAVERACEÆ.—*Chelidonium majus*, L., celandine, upon which a considerable amount of work has been done of recent years by American pharmacists; *Papaver Rhœas*, L., the red poppy, and *P. somniferum*, L., the opium poppy; and *Sanguinaria Canadensis*, L., the North American bloodroot.

UMBELLIFERÆ.—Many of these are more especially known to pharmacists on account of their fruits, and others by reason of the gum-resins which they yield. The following from among the former are grown at Kew: *Apium graveolens*, L., celery; *Archangelica officinalis*, L., or "*Angélique officinale*"; *Carum Carvi*, L., caraway, and *C. Petroselinum*, Benth. et Hook. f., parsley; *Conium maculatum*, L., hemlock; *Coriandrum sativum*, L., coriander; *Cuminum Cyminum*, L., cummin; *Œnanthe Phellandrium*, Lam., the "*Phellandrie aquatique*" of the French Codex; *Peucedanum graveolens*, Benth., dill; and *Pimpinella Anisum*, L., or anise. The umbelliferous plants yielding resins or gum-resins are represented by *Dorema Ammoniacum*, D. Don., the plant from which ammoniacum is obtained; *Ferula Asafœtida*, L., and *Ferula Narthex*, Boiss., the sources of gum asafetida; *Ferula Galbaniflua*, Boiss. & Buhse, the Galbanum Plant; *Opoponax Chironium*, Koch., supposed to yield the almost obsolete drug, opoponax; and *Thapsia Garganica*, L., from which "*Résine de Thapsia*" is extracted. With the exception of *Hydrocotyle Asiatica*, L., of which the whole plant is used, and of hemlock leaves, the other drugs derived from this natural order are roots, including one rhizome; the plants yielding them are: *Daucus Carota*, L., carrot, the root-pulp of which is used as an application for scalds and burns; *Ferula Sumbul*, Hook. f.; *Laserpitium latifolium*, L., or white gentian; *Levisticum officinale*, Koch., or lovage; and *Peucedanum ostruthium*, Koch., the source of "*Rhizome d'Impératoire*."

COMPOSITÆ.—*Achillea Millefolium*, L., the yarrow of herbalists; *Anacyclus Pyrethrum*, DC., pellitory; *Anthemis nobilis*, L., chamomile, and the closely related *A. Cotula*, L., or Mayweed; *Arnica montana*, L., whose rhizomes and flowers are both used; *Artemisia Absinthium*, L., "*Absinthe*" or wormwood, and *A. maritima*, L., of which the variety *Stechmanniana* yields the santonica or "Wormseed" of commerce; *Calendula officinalis*, L., marigold, and *Carthamus tinctorius*, L., safflower, whose florets contain coloring matter and have been used to adulterate saffron; *Chrysanthemum carneum*, Steud., one of the sources of Persian insect flowers, and *C. Parthenium*, Bernh., or feverfew, a substitute of chamomile; *Cnicus benedictus*, L. (*Carbenia benedicta*, Adans.), the Blessed Thistle; *Cichorium Intybus*, L., chicory; *Erigeron Canadensis*, L., and *Erigeron Philadelphicus*, L., both known in the United States as fleabane or scabious; *Eupatorium perfoliatum*, L., boneset; *Helenium autumnale*, L., or sneezewort; *Grindelia squarrosa*, Dunal; *Inula Helenium*, L., elecampane; *Lactuca virosa*, L., the source of lactucarium, and one of the few composites in which a well-defined alkaloid (hyoscyamine) has been found; *Senecio*

INTERIOR OF SUCCULENT HOUSE, KEW GARDENS.

vulgaris, L., groundsel, which still figures among the drugs of the French Codex ; *Tanacetum vulgare*, L., the tansy of herbalists ; *Taraxacum officinale*, Weber, dandelion ; and *Tussilago Farfara*, L., or coltsfoot.

SOLANACEÆ.—The most important plants of this collection are those which yield the mydriatic alkaloids, viz.: *Atropa Belladonna*, L.; *Datura fasluosa*, L., and *D. Metel*, L., official in the Colonial and Indian Addendum of the British Pharmacopœia, and *D. Stramonium*, L.; *Hyoscyamus albus*, L., *H. muticus*, L., and *H. niger*, L.; and *Scopolia Carniolica*, Jacq. Four other plants of this order that are represented, are of comparatively little importance in medicine—they are: *Mandragora officinarum*, L., mandrake, formerly of great repute with the disciples of the doctrine of signatures, because of the similarity to the human form which some of its roots assume; *Nicotiana Tabacum*, L.; *Solanum nigrum*, L., and *S. tuberosum*, L., the potato, both still retained in the French Codex, the former for the preparation of a medicinal oil, and the latter as the source of potato starch, used in enemata, poultices, and for making a nutrient broth.

LILIACEÆ.—Although the drug-producing plants of this order are not numerous, a few of them are of the greatest importance. The following are grown out of doors in the Herbaceous collection at Kew: *Colchicum autumnale*, L.; *Convallaria majalis*, L.; *Polygonatum officinale*, All., and the closely related North American species, *P. biflorum*, Ell., whose rhizomes, formerly held in great esteem by the adherents of the doctrine of signatures, are now seldom used; *Urginea Scilla*, L., the Squill of the Pharmacopœias; *Trillium erectum*, L., with acrid rhizomes now never used in medicine; *Veratrum album*, L., white hellebore, and the North American species, *Veratrum viride*, Ait., both yielding rhizomes possessing similar properties to each other.

THE PLANT HOUSES.

With the exception of the Temperate House, which is situated in the Arboretum, facing the Pinetum, all the plant houses are located in the Botanic Gardens (see Plate X). Five of them, viz., the Succulent House, the Temperate and the Tropical Economic Houses, the Palm House, and the Temperate House, are devoted, at least in part, to the culture of medicinal plants.

The Succulent House (see Plate XII) was completed in 1855, in Sir William Hooker's term of office, and took the place of two old lean-to houses of about a third the area. It was newly roofed last year (1904). The collection of succulents, already considerable as early as 1768, was much increased by the labors of Francis Masson, already mentioned as the first botanical collector sent out from Kew, and by another Kew collector, James Bowie, who was sent to the Cape of Good Hope in 1817, and remained there five years; the collection was also much enriched in 1887 by purchases from the Peacock collection.

The most important medicinal plants in the Succulent House are the numerous species of *Aloe* from which aloes is obtained; among these may be mentioned *Aloe Perryi*, Baker, one of the plants from which Socotrine aloes is known to be derived, *A. ferox*, Mill., which yields a part, at least, of Cape aloes, and *A. Chinensis*, Baker, to which Barbados or Curacoa aloes has been referred; other species are doubtless used for the production of aloes, but nothing very definite is known on the subject. Other plants of interest in this collection are: *Cereus grandiflorus*, Mill., whose flowers are known in commerce as "Cactus Grandiflorus"; *Euphorbia resinifera*, Berg., the source of Euphorbium; *Nopalea coccinellifera*, Salm-Dyck (*Opuntia cochinillifera*, Mill.), which, together with other species of the same genus, serve as food for the cochineal insect; and *Xanthorrhœa hastilis*, R. Br., the source of the resin known in commerce as grasstree gum or gum acroides.

The two Economic houses form part of a "range" constructed in the form of a **T** (see Plate X). The heating of this range is so devised that the highest temperature is attained near the junction of the bars of the "**T**," the houses becoming cooler towards the extremities. This "New Range," as it is called, was erected in 1869, shortly after the opening of the "Kew Gardens" railroad station. The Director's report to Parliament for 1881 contains a list of the economic plants growing at Kew at that time, and, in connection with this list, the Director stated that when the Economic houses were built "some of the most conspicuous and now widely spread and even commercially important of the plants for which they were intended, were absolutely unknown in Europe, or known only as botanical curiosities of no known use to mankind; such are some of the cinchonas, of the American and African rubbers, the Liberian coffee, etc." In 1899 these houses were rebuilt as they exist at present. It had been one of Sir William Hooker's main objects, from the first, to pay special attention to the study and cultivation of economic plants, including such as are used in medicine, but it was not until 1865 that any attempt was made to bring them together, when an old house, known as the "Victoria House," was set aside by Sir Joseph Hooker for the purpose. On the completion of the new range this old Victoria House was demolished.

The following is a list of the medicinal plants growing in the Economic houses when I last visited them:

In the tropical house:—*Abrus precatorius*, L., from which are obtained the poisonous Jequirity seeds used in ophthalmic practice; *Acacia Catechu*, Willd., the source of Black Catechu or Cutch; *Œgle Marmelos*, Correa, whose fruit is used in India for the treatment of dysentery; *Anamirta Cocculus*, Wight et

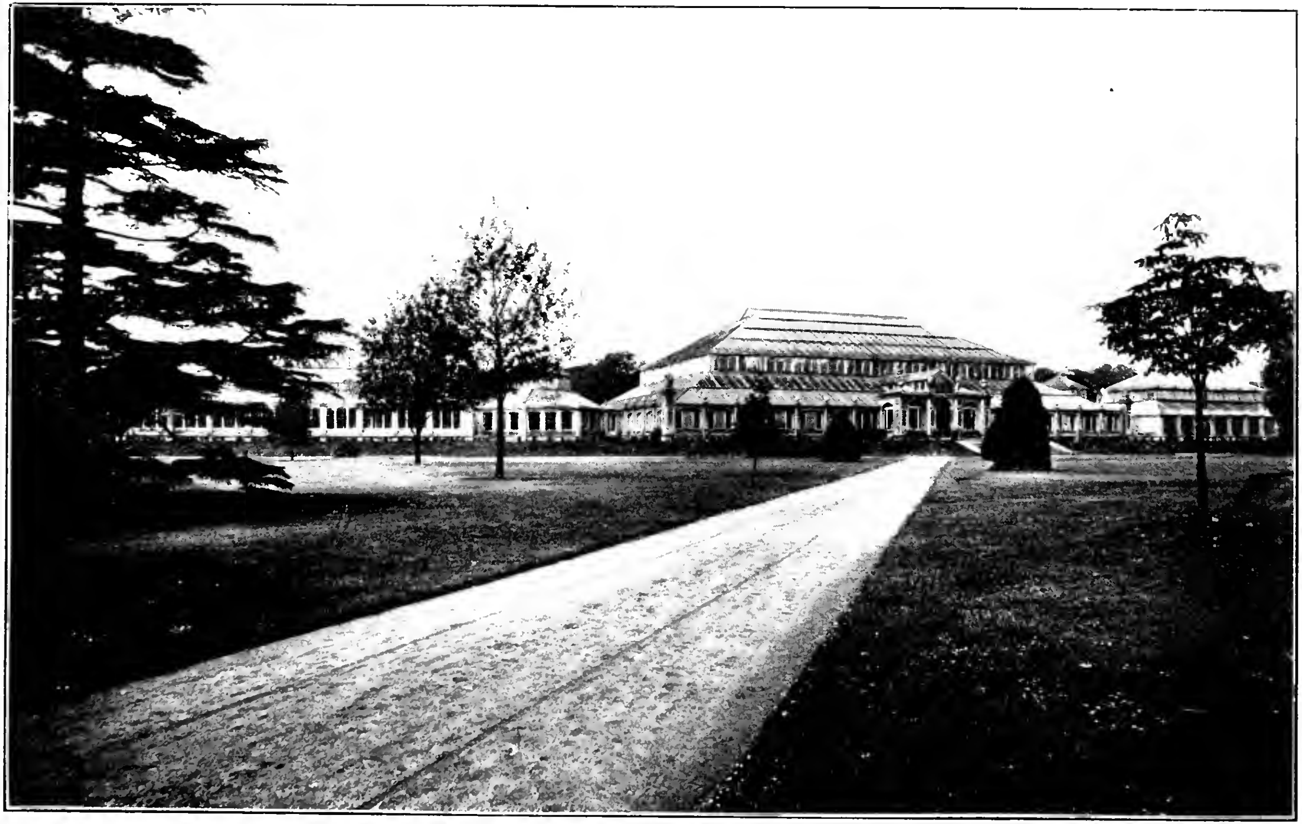
Arn., from whose fruits, known in commerce as "Cocculus Indicus," picrotoxine is prepared; *Antiaris toxicaria*, Lesch., the Upas tree of Java, with a poisonous latex; *Bixa Orellana*, L., the seeds of which are used for the preparation of Annatto; *Butea frondosa*, Roxb., source of Bengal Kino; *Canella alba*, Murr.; *Cephaelis Ipecacuanha*, Rich., from which the Ipecacuanha root of the Pharmacopœias is obtained; *Cinnamomum Cassia*, Blume, or Chinese Cassia; *Citrus Aurantium*, L., *C. medica*, L., the Citron tree, and *C. Limetta*, or Sweet Lime, from which lime juice is prepared; *Cissampelos Pareira*, L., for a long time considered to be the source of Pareira Brava, and the root of which is now admitted into the Colonial and Indian Addendum of the B. P.; *Coffea Arabica*, L., and the more vigorous *C. Liberica*, Hiern, which has, consequently, been the subject of much cultural experiment; *Cola acuminata*, S. and E., from which Kola Nuts are obtained; *Copaifera officinalis*, L., a probable source of Copaiba; *Curcuma longa*, L., or Turmeric; *Derris elliptica*, Benth., an East Indian fish poison; *Elettaria Cardamomum*, Maton, the plant which yields official Cardamoms, and the closely related *Amomum Melegueta*, Rosc., source of Grains of Paradise; *Erythrophlœum Guineense*, G. Don, a Tropical African tree whose bark, known in commerce as Sassy Bark, is used by the natives as an ordeal poison; two Cocas, viz., *Erythroxylon Coca*, Lam., and *E. Coca* var. *Spruceanum*, Burck; *Guaiacum officinale*, L., and *Guaiacum sanctum*, L., the trees from which "*lignum vitæ*" and guaiacum resin are obtained; *Marsdenia Cundurango*, Nicholls, source of Cundurango bark; *Myristica fragrans*, Houtt., the Nutmeg tree; *Myroxylon Pereiræ*, Klotz., from the bark of which Balsam of Peru is obtained; *Nicotiana Tabacum*, L.; *Paullinia Cupana*, H. B. K., whose seeds, roasted and ground into a paste with water, constitute the guarana of commerce; *Picræna excelsa*, Lindl., or Jamaica Quassia; *Pilocarpus pennatifolius*, Lem., whose leaflets are known in commerce as Paraguay Jaborandi; *Pimenta acris*, Kostel., the volatile oil of which is used in making Bay Rum, and *P. officinalis*, Lindl., whose fruits constitute Allspice; *Piper Betle*, L., whose leaves are official in the B. P. Indian and Colonial Addendum, *P. Cubeba*, L., the Cubeb plant, *P. Longum*, L., or Long Pepper, and *P. nigrum*, L., the source of Black and White Peppers; *Quassia amara*, L., or Surinam Quassia; *Strophanthus hispidus*, DC., whose seeds, together with those of other species of Strophanthus, have been used in heart disease; *Tamarindus Indica*, L.; *Theobroma Cacao*, L., the source of Cocoa; *Toluifera Pereiræ*, Baillon (*Myroxylon Toluiferum*, H. B. K.), the tree yielding Balsam of Tolu; and several plants yielding india-rubber.

The following, not previously mentioned, were noted in the temperate Economic house: *Acacia Arabica*, Willd., whose bark is official in the Colonial and Indian Addendum of the B.P., as is also that of *Alstonia scholaris*, R. Br.; *Canna edulis*, Ker., the source of Queensland arrowroot; *Cassia obovata* Collad., whose leaflets are known as Suez senna; *Ceratonia Siliqua*, L., whose fruits, known as "Locust Beans," are official in the French Codex under the name of "*Caroubes*"; *Cinchona Calisaya*, Wedd., *C. Ledgeriana*, Moens, *C. Pahudiana*, How., and *C. officinalis*, L.; *Cinnamomum Camphora*, Nees, the tree yielding camphor, and *C. Zeylanicum*, Breyne, the cinnamon tree; *Citrus Aurantium*, L., var. *Bergamia*, or bergamot; *Croton Tiglium*, L., from the seeds of which Croton oil is obtained; *Dracæna Draco*, L., the source of dragon's blood in tears; *Eucalyptus Amygdalina*, Labill., and *E. citriodora*,

Hook., from the leaves of which volatile oils are distilled; *Ilex Paraguayensis*, Lamb., whose leaves are known as "Maté" and contain caffeine; *Illicium verum*, Hook. f., with aromatic fruits yielding oil of anise by distillation, and *I. religiosum*, S. & Z., a poisonous Japanese species; *Melaleuca Leucadendron*, L., or Cajeput; *Olea Europæa*, L., the olive; *Peumus Boldus*, Molina, or Boldo; *Phœnix dactylifera*, L., or date palm; *Quillaja Saponaria*, Molina, the source of soap-bark; and *Zizyphus Jujuba*, L., whose fruit-pulp is used in the preparation of the "*Pâte de Jujube*" of the French Codex.

The Palm House.—This building was completed in 1848, and the collections of palms and other tropical plants that had previously ocupied the house erected by William IV, near the main gate, were transferred to it. The heating arrangements at first were unsatisfactory, but in 1877 these were made efficient by the installation of a perfected arrangement of boilers. The arrangement of the plants is, to a considerable extent, a geographical one, the smaller specimens on the benches skirting the sides being grouped together according to the continents of which they are natives, Tropical Asiatic, Tropical American, and Tropical African plants, for instance, being successively placed together on the benches. The larger plants growing in the central beds follow no very definite arrangement, but are largely grouped for convenience or effect. Such medicinal plants as are grown in the Palm House are scattered throughout the collections; many of them have already been enumerated in connection with the contents of the Tropical Economic House; but the specimens in the Palm House, owing to greater space, are finer, as, for instance, *Myristica fragrans*, Houtt.; *Theobroma Cacao*, L., and *Strophanthus hispidus*, DC.

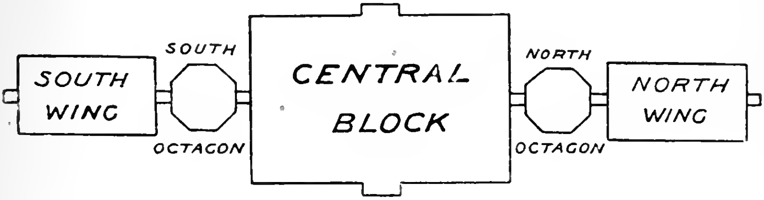
Among the plants not already enumerated, the following yield products of interest to pharmacists: *Areca Catechu*, L., the areca-nut palm; *Carica Papaya*, L., or papaw, from the latex of which papain is prepared; *Cocos nucifera*, L., the cocoanut palm; *Elais Guineensis*, Jacq., whose fruits yield palm oil; *Eugenia caryophyllata*, Thunb., whose dried flower-buds are known as "cloves;" *Gossypium herbaceum*, L., *G. arboreum* L., Old World species of the cotton plant, and *G. Barbadense*, L., the source of American cotton; *Hæmatoxylon Campechianum*, L., or logwood; *Musa sapientum*, L., the banana, and its variety, *Paradisiaca*, the plantain; *Piper angustifolium* R. & P., whose leaves are known in commerce as "matico," and *P. methysticum*, Forst., whose rhizome is official in the Colonial and Indian Addendum of the B. P. under the name of "kava-kava rhizome;" *Smilax ornata*, Hook. f., the plant whose root constitutes the "Jamaica" sarsaparilla of the pharmacopœias; *Saccharum officinarum*, L., the sugar cane; *Strychnos Ignatii*, Berg., and *S. Nux vomica*, L.



Temperate Hcuse, Kew Gardens.

INTERIOR OF TEMPERATE HOUSE (CENTRAL BLOCK), KEW GARDENS.

THE TEMPERATE HOUSE.—This building consists of several distinct divisions, as shown in the accompanying plan :



The two octagons were completed in 1861 and the central block in 1862. The north wing was added in 1897 and the south wing in 1899. The principal feature of the central block is the Australian collection which formerly occupied the old Orangery (now Museum III) and a lean-to house located immediately to the left of the present Succulent House. This collection was subsequently removed to the conservatory near the main gate, and finally deposited in the present building in 1862, where it has since remained. There are few plants of interest here that have not already been mentioned, but reference must be made to the collection of *Eucalypti*, among which *Eucalyptus globulus*, Labill., the species yielding official Eucalyptus oil, is represented. *Quillaja Saponaria*, Molina, the soap-bark tree, and *Olea Europæa*, L., of considerable size, are also grown in this collection. The northern octagon is used principally for the display of ornamental plants and the southern as an orangery. The north wing is devoted to the cultivation of rhododendrons and camellias, while the south wing, heated to a temperature intermediate between that of the remainder of the building and of the Palm House, contains numerous Mexican plants and is hence known as the Mexican House. It is, however, more especially of interest to us on account of a number of large specimens of medicinal plants for which its temperature is well adapted. Especially prominent among these are the cinchonas and plants producing india-rubber.

[*To be continued.*]

THE INORGANIC CHEMICALS OF THE U.S.P., VIII.

BY H. V. ARNY, PH.D.

The request of the editor of the AMERICAN JOURNAL OF PHARMACY for a critique of the chemicals of the new pharmacopœia has been taken up by the writer with some hesitation, since the field has been so thoroughly thrashed and that by such able workers. The reviews written by Dr. Lyons for the American Pharmaceutical Association and those by Professors Hinrichs and Schimpf in the November JOURNAL leave little to be said; so the writer can scarce do more than offer a few gleanings by way of personal opinions.

In beginning, the writer desires to add his to the many voices raised in praise of our new standard, as it is indeed a monument to modern American pharmacy. Rarely has a revision brought about so many radical changes and, what is best, nearly every change is a distinct advance over the standards of a decade since.

Quite gratifying is it to note that the revisers have viewed the commercial side of pharmacy in a manner that is as practical as it is sensible; as is most strikingly shown in the "Purity Rubric." This designates the permissible deviation from the ideal and will prove a decided safeguard to those retail pharmacists whose interests are jeopardized by overzealous Food and Drug Commissioners; a safeguard more than counterbalancing any possible objection raised against reduction of the standard based on the fact that the average manufacturer is prone to live only up to the minimum requirement of any standard.

ADDITIONS.

It will be interesting to note whether *Diluted Hydriodic Acid* will keep any better than does diluted hydrobromic acid or syrup of hydriodic acid. Of course, the potassium hypophosphite directed in the recipe is supposed to yield enough hypophosphorous acid to preserve the hydrogen iodide, but will it accomplish the purpose any better than it did in the syrup of 1890?

Compound Solution of Chlorine is a distinct improvement over the chlorine water of the former pharmacopœias, as far as ease in manufacture is concerned, and should answer most of the therapeutical requirements of its predecessor.

Compound Solution of Sodium Phosphate seems a rather belated

recognition of an old friend, exploited far more largely ten years since than it is to-day.

The substitution of *Effervescent Magnesium Sulphate* for the effervescent magnesium citrate of the last pharmacopœia is scarcely an improvement, although the change may be appreciated by those who are looking for easier methods of manufacture. The change in method of granulating of this and all other official effervescent salts—softening the mass by fusion of citric acid, instead of with alcohol—is a distinct advance.

While speaking of the new effervescent salts mention must be made of *Effervescent Sodium Phosphate*, which promises to be the most popular preparation of this class of officials.

The introduction of *Compound Syrup of Hypophosphites*, similar to that of the last edition of the National Formulary, satisfactorily settles the question long vexing the retail pharmacist as to which of the two official and several unofficial forms of syrup of hypophosphites should be dispensed on prescriptions calling for "Syr. Hypophos. Comp."

OMISSIONS.

Most of the chemicals omitted from U.S.P., VIII, either were products of little value or of service only in preparing other chemicals no longer official or the manufacture of which is no longer given. Among such we might cite *Barium Dioxide*, used in U.S.P. 1890 for making solution of hydrogen dioxide; and *Ferrous Lactate*, used in the now unofficial syrup of hypophosphites with iron. Two seemingly unnecessary omissions are *Sulphurated Antimony*, which is a very popular expectorant among the French physicians of the South; and more particularly *Solution of Ferric Citrate*. In dispensing pharmacy, the liquid form of the slowly soluble ferric citrate is invaluable, and while, of course, this can still be used, even though unofficial, its omission is unfortunate, especially since the process of manufacture of even ferric citrate is not given in the new pharmacopœia.

CHANGES IN NAMES.

The conversion of the familiar names, arsenous acid and chromic acid into *Arsenic Trioxide* and *Chromium Trioxide* respectively, while scarcely destined to become popular in prescription writing, is a step toward correct nomenclature. Not so, however, with the substitu-

tion of the clumsy titles *Sodium Hydroxide*, *Potassium Hydroxide*, *Calcium Oxide* and *Magnesium Oxide*, for the simpler and equally distinctive terms soda, potassa, lime and magnesia, employed by former pharmacopœias.

The use of the word "acid" for an acid anhydride, such as arsenic trioxide, *is* confusing, especially to students, but no such objection can be raised against the use of the word "soda" for sodium hydrate, now that we are learning to call the metal itself sodium.

Imagine a physician taking the time to write out "Liquor Sodii Hydroxidi"!

Nor does the change of the simple *Spiritus Glonoini* into the cumbersome *Spiritus Glycerylis Nitratis* seem very happy.

CHANGES IN FORMULÆ.

The reduction of chemical formulæ to their simplest form, such as

Alum	from $K_2Al_2(SO_4)_4\ 24H_2O$	to $KAl(SO_4)_2\ 12H_2O$
Ferric Alum	" $(NH_4)_2Fe_2(SO_4)_4\ 24H_2O$	" $NH_4Fe(SO_4)_2\ 12H_2O$
Ferric Hydrate	" $Fe_2(OH)_6$	" $Fe(OH)_3$
Ferric Chloride	" Fe_2Cl_6	" $FeCl_3$
Mercurous Chloride	" Hg_2Cl_2	" $HgCl$
Mercurous Iodide	" Hg_2I_2	" HgI

is a sacrifice of theory to simplicity, and in view of the present indefinite knowledge of the real molecular weights of these bodies, the change is perhaps for the best.

From the pedagogic standpoint, however, the new formulæ are less easy to explain than were the old.

CHANGES IN STRENGTH.

Changes of this character in the new pharmacopœia have been in the direction of sensible acceptance of actual conditions. Thus the absurdly severe requirement of the U.S.P. 1890 for *Chlorinated Lime* (36 per cent. chlorine) has been lessened to 30 per cent.; while the chlorine requirement for *Solution of Chlorinated Soda* has been reduced from 2·6 per cent. to 2·4 per cent. Since the recipe for the manufacture of the latter has been improved by increasing the amount of chlorinated lime employed, the process is much more feasible than was the impossible recipe of 1890.

Sulphurous Acid has been reduced from 6·4 per cent. to 6 per cent.; *Solution of Lime* from 0·16 per cent. to 0·14 per cent.; *Solu-*

tion of Ferric Chloride from 13 per cent. iron to 10 per cent. iron; while *Syrup of Ferrous Iodide* has been reduced from 10 per cent. ferrous iodide to 5 per cent. ferrous iodide—this conforms with the recently adopted international standard. On the other hand, a few preparations have been increased in strength, notably, *Solution of Iron and Ammonium Acetate*, which contains about twice as much iron as before, and *Solution of Ferric Sulphate*, which has been raised from 28·7 per cent. ferric sulphate to 36 per cent. ferric sulphate.

CHANGES IN MANUFACTURE.

The omission of a recipe for the manufacture of *Solution of Hydrogen Dioxide* was a wise step, since it is scarcely sensible for the retailer to manufacture this and other chemicals, which can be produced so much more satisfactorily by the large manufacturer.

Not so, however, with the omission of the process of making the *scale salts of iron*. If the manufacture of ferric citrate was deemed too intricate for the retailer, the committee on revision could have at least retained the recipes for those scale salts made from the citrate and especially those containing alkaloids; it being well known that much of these found in commerce is deficient in strength. And far simpler is it for the retailer to make these than to assay those that he buys.

The change in making *Lead Plaster*, from heating olive oil, litharge and water, to precipitation of sodium oleate with lead acetate, will bring forth a sigh of regret from those in charge of pharmaceutical laboratories and wont to choose the making of lead plaster as the particular test of the pharmaceutical ability of the students.

The committee on revision has fortunately preserved to the teacher the other bug-bear—*Ointment of Mercuric Nitrate*—but even this has been made a bit simpler by substituting lard for lard oil.

The substitution of *Monohydrated Sodium Carbonate* for the formerly official efflorescent sodium carbonate containing ten molecules of water of crystallization in all preparations where sodium carbonate is required, is a step toward accuracy, provided the new official is as stable as we are told it is. There have been several statements in the press that the monohydrated salt is unobtainable, but this criticism is not just, since the product is now listed by several chemical manufacturers and that at a reasonable figure.

With the substitution of a pure, artificial *Precipitated Manganese*

Dioxide for the native ore recognized in the former pharmacopœias, comes a recipe for its manufacture.

The omission of the chemical processes of manufacture of solution of soda and solution of potassa;—beg pardon!—*Solution of Sodium Hydroxide* and *Solution of Potassium Hydroxide*, leaving the recipe for the simple solution of stick soda or potassa in water, is a wise move, since very few pharmacists take the trouble to make these solutions by boiling the alkaline carbonates with lime.

As the writer has already pointed out (Proceedings A. Ph. A., 1901, p. 227) the preparation of *Spirit of Ammonia* by the process of 1890 was not feasible.

The new pharmacopœia attempts improvement by slight alterations in the distilling apparatus; but—though scarcely fair to criticise without a trial of the new process—the writer still thinks that the only successful way to make this spirit is by producing the gas from ammonium chloride and alkali and passing this through alcohol under pressure.

It is with regret that the writer notes that the impossible process for making *Sulphur Iodide*, given in U.S.P., 1890, is perpetuated in the new pharmacopœia.

CHANGES IN TESTS.

The tests of the new pharmacopœia are in keeping with the high standard of the work. Modern processes are introduced wherever possible, volumetric assays enlarged and assays for active principles of crude drugs are largely augmented.

In the domain of inorganic chemistry not so many changes have been made, but wherever new tests are improvements over the older ones, the modern test is the one accepted.

Much space has been saved by giving details in the appendix for the detection of *heavy metals* and of *arsenic* by the modified Gutzeit test, in various chemicals, leaving necessary only a short reference to the tests under the description of each chemical in which such impurities are likely to be found. This space-saving device could, it seems, be carried still further. There seems no good reason why the tests for—say chlorides—should not be elaborately discussed in the appendix and reference to this article placed in the description of every official chloride and in a similar way treat all other metallic and acidulous radicals found in official chemicals. Of course,

special modifications of the official test should be described under the official salt, where such change is necessary.

In the same way, it seems that all tests for the most important impurities could be summed up in the appendix, as are now those for heavy metals and for arsenic, thus requiring under each chemical discussed bare mention of the impurities likely to be present and reference to the article where the test is discussed in detail.

QUALITATIVE TESTS.

The pharmacopœial requirements for the following chemicals have been reduced by the omission of those tests for impurities (stated in U.S.P. 1890), given below:

CHEMICALS.	IMPURITIES OMITTED.
Prepared chalk.	Magnesium, iron, barium and sulphates.
Potassium bitartrate.	Calcium, chlorides and sulphates.
" carbonate.	Thio-sulphates, sulphates, chlorides, cyanides and sulphides.
" and sodium tartrate.	Sulphates and chlorides.
" ferrocyanide.	" " "
" hydroxide.	Calcium, soda, sulphates, chlorides, silicates and nitrates.
" hypophosphite.	Calcium, chlorides, sulphates and phosphates.
" iodide.	Iron and sulphates.
" nitrate.	Calcium, sulphates and chlorides.
" sulphates.	" magnesium and "
Sodium acetate.	" sulphates " "
" benzoate.	Potassium, " " "
" bicarbonate.	" calcium, sulphates, chlorides, sulphites and thiosulphates.
" bisulphite.	Sulphates and chlorides.
" borate.	Calcium, sulphates and chlorides.
" bromide.	" potassium, sulphates and moisture.
" chloride.	" " magnesium and sulphates.
" hydroxide.	" chlorides, sulphates and nitrates.
" hypophosphite.	" potassium, chlorides, sulphates and phosphates.
" iodide.	Calcium, sulphates and moisture.
" nitrate.	Potassium, calcium, magnesium, sulphates and chlorides.
" phosphate.	Potassium, hypophosphites, chlorides and sulphates.
" pyrophosphate.	Potassium, chlorides and sulphates.

The reduction in quality just cited is a part of the more rational view of the quality of chemicals which inspired the introduction of

the purity rubric already commented upon. It should not be considered as a real depreciation in quality.

The number of cases where the quality has been raised by introduction of tests for impurities not mentioned in the old pharmacopœia is few. Among these may be cited a test for the presence of alum in potassium bitartrate, tests for heavy metals and arsenic in potassium hypophosphite, and for barium, chlorides, bromides and thiosulphates in potassium iodide.

The procedure of most tests has been changed but little; but among the changes may be cited the use of sulphanilic acid and naphthylamine acetate for detecting *nitrites in water*, the detection of iodine in calcium bromide, sodium nitrate, strontium iodide and zinc bromide by shaking out with chloroform instead of using starch paste (the iodine being in both cases liberated by use of chlorine water), and the detection of bromine in potassium and sodium bromides by use of silver nitrate, instead of by liberation of the bromine with chlorine water, as directed in the old pharmacopœia.

VOLUMETRIC ASSAYS.

Boric Acid is now estimated by titration with normal solution after addition of glycerin—an admirably exact method, though somewhat costly, since, 50 c.c. glycerin has to be used in each operation.

Reduced Iron is no longer titrated with volumetric solution of potassium permanganate, but is assayed by treating it with a definite amount of iodine in potassium iodide solution and titrating the unused iodine with decinormal thiosulphate solution.

Magnesium Oxide is assayed by mixing it with a definite amount of normal sulphuric acid and titrating the unused acid with normal alkali. This process of acidimetry is used several times in the new pharmacopœia in preference to direct titration with normal acid.

Sodium Sulphite is now treated with a definite amount of decinormal iodine solution and the unused iodine titrated with decinormal thiosulphate solution until colorless—instead of direct titration with decinormal iodine solution and starch mucilage, as directed in the old pharmacopœia.

Strontium Iodide, *Zinc Iodide* and *Syrup of Hydriodic Acid* are no longer titrated with decinormal silver nitrate solution in the presence of potassium bichromate, but are treated with a definite quantity of decinormal silver nitrate solution, and the excess of silver nitrate

titrated with decinormal potassium sulphocyanate solution; ferric alum being used as the indicator.

There has been introduced an assay process for *Sulphur Iodide*—titration of a potassium iodide solution with decinomal thiosulphate solution, starch mucilage being used as the indicator.

The basis of acidimetry and alkalimetry has been shifted from the old standard of a carefully prepared normal solution of oxalic acid (from specially purified crystals) to a normal alkali solution, standardized by titrating with a solution containing a definite amount of potassium bitartrate, which has been carefully purified.

As to indicators, the new pharmacopœia shows an evident fondness for methyl orange, using it in several cases where phenolphtalein is usually employed and that far more satisfactorily. While methyl orange may be more accurate than phenolphtalein in some cases and that to an eye trained to color changes, it must be admitted that for the average observer the change from orange to pink is so gradual that it frequently means the addition of one cubic centimeter of the volumetric solution to determine the end of the reaction. For carbonates, its use is perhaps a necessary evil, but its application instead of phenolphtalein in such cases as estimation of soda and solution of soda, and in place of rosolic acid in estimations of ammonia, seems a mistake.

In many cases the attempt at accuracy in getting the desired quantity of the chemical to be tested gives rise to directions that when followed out can lead to naught but complex or clumsy processes.

Thus in the case of acetic acid, instead of directing the weighing of 5·96 grammes of the acid, it is directed that 10 grammes be weighed, then diluted with water enough to make 100 c.c. and 59·6 c.c. of this latter solution be employed. The only method of accurately measuring 59·6 c.c. is by means of a burette, and as the average burette delivers but 50 c.c. liquid it means the filling of the burette twice, to say nothing of the annoyance of then getting the burette into commission as measurer of the volumetric alkali solution next to be used; for it is no exaggeration to say that few pharmacists keep more than one burette on hand. Far better would it have been to have retained the formerly prescribed quantity—6 grammes of acetic acid.

A CRITICAL REVIEW OF THE INORGANIC CHEMISTRY OF THE NEW UNITED STATES PHARMACOPŒIA.

By Henry W. Schimpf.

(*Continued from page 562, December, 1905.*)

THE INORGANIC ACIDS.

Acidum Boricum (H_3BO_3).—It should be not less than 99·8 per cent. pure. The 1890 Pharmacopœia stated that the solubility of boric acid in water is increased by the addition of hydrochloric acid. The new Pharmacopœia, however, contradicts this statement, and declares that the addition of hydrochloric acid decreases the solubility, which latter statement, according to N. Herz, *Zeits. Unorg. Chem.*, *33*, 335, is correct.

The tests for impurities are the same, with the exception of the time-limit test, for heavy metals, and the omission of tests for ammonia and for sodium. A *Volumetric Assay Method* is given. In this a solution of boric acid in water and glycerin is titrated with normal sodium hydroxide V. S., using phenolphthalein as indicator.[1]

The *Diluted Mineral Acids* are all 10 per cent. in strength. Dilute hydrocyanic acid is 2 per cent. The strong mineral acids remain of the same strength, except that aromatic sulphuric acid which is 20 per cent. instead of 18·5 per cent., and sulphurous acid is 6 4 instead of 6 per cent.

Acidum Hydrocyanicum Dilutum.—The distillation method for the preparation of this acid, in which a solution of potassium ferrocyanide and sulphuric acid were made to react, has been dismissed, as it should be. Very few, if any, retail druggists have the facilities for manufacturing an article of this kind, and therefore its production is best left to the manufacturer. The alternate method, which was official, as well, in the old Pharmacopœia, and by means of which the extemporaneous manufacture of diluted hydrocyanic acid is easily accomplished, is now the official process. In this method silver cyanide is added to diluted hydrochloric acid, the mixture shaken and when the precipitate has settled the clear liquid is poured off:

$$AgCN + HCl = AgCl + HCN.$$

---

[1] Thomson, J. S. C. I., xii, 432, finds that the addition of 30 per cent. or more of glycerin in this assay increases the susceptibility of phenolphthalein in titrating boric acid.

The old assay method, in which the acid is mixed with magnesia and water and titrated to the point where the indicator (potassium chromate) produces a red tint, is replaced by the better method of W. J. Sharwood, which is a modification of Denige's.

In this method 5 grammes of diluted hydrocyanic acid are diluted with distilled water to measure 50 c.c. Then 26.9 c.c. of this solution, after the addition of 5 c.c. of ammonia water and 3 drops of potassium iodide T. S. are titrated with tenth-normal silver nitrate V. S., until a slight permanent precipitate occurs. The ammonia water and potassium iodide in this process act as indicator.

The reactions may be expressed thus:

$$(1)\quad 2NH_4CN + AgNO_3 = NH_4Ag(CN)_2 + NH_4NO_3$$
$$(2)\quad NH_4Ag(CN)_2 + AgNO_3 = NH_4HO_3 + 2AgCN$$
$$(3)\quad KI + AgNO_3 = KNO_3 + AgI$$

The silver nitrate forms with the cyanide a double salt which is soluble, no precipitate occurring until after all of the cyanide has entered into combination as the double salt; then the further addition of silver nitrate decomposes the double salt, and a precipitate of silver cyanide occurs. In the presence of ammonia water, however, as in the above assay, the precipitation of silver cyanide is prevented, but the iodide is now (not before) acted upon by the silver solution and a precipitate of silver iodide occurs, which very delicately indicates the end reaction. As regards the other mineral acids very few changes are noted.

Bettendorf's test for arsenic is replaced in every instance by the modified Gutzeit's test, and the sulphide method of testing for metals as impurities is replaced by the "time-limit test." The volumetric assay is modified. Instead of a definite weight of the acid being taken for analysis, it is directed in most cases to take 3 c.c. in a stoppered weighing bottle and weigh accurately; the standard solution used is normal potassium hydroxide, and, except in the case of phosphoric acid, methyl orange is the indicator; in this case phenolphthalein is used.

For the detection of free *Chlorine* or *Bromine* in hydrochloric acid, it is recommended to dilute 1 c.c. of the acid with 5 c.c. of water and add 1 c.c. of potassium iodide T. S. and 1 c.c. of chloroform, then to shake the mixture and note if the chloroform shows a violet coloration. This test replaces the old and less reliable zinc-iodide

starch T. S. No test for copper as an impurity is given. Under sulphuric acid a test for selenium is given.

The volumetric assay process for aromatic sulphuric acid is one of residual titration. A measured excess of normal potassium hydroxide V. S. is taken and retitrated with normal sulphuric acid.

The preparation of *Acidum Sulphurosum* is the same as before. It differs only in a slight detail, which is that the distilled water into which the gas (SO_2) is passed is kept at a temperature of 10° C. or below, by surrounding the containing flask with ice. The gas is then completely absorbed and the use of an additional flask containing sodium carbonate solution to take up the excess of the gas is not needed.

The Assay of Sulphurous Acid.—Of this acid 2 c.c. are measured into a stoppered weighing bottle and accurately weighed. A measured excess of tenth-normal iodine V. S. is then added and after five minutes' standing the mixture is titrated with tenth-normal sodium thiosulphate until decolorized. This is a much more satisfactory way than the old one of direct titration with the iodine V. S. and starch as indicator.

ALUMINUM SALTS.

Alumen should contain not less than 99·5 per cent. of pure aluminum and potassium sulphate. The chemical formula is given as $AlK(SO_4)_2 + 12H_2O$ instead of $Al_2K_2(SO_4)_4 + 24H_2O$.

Alumen Exsiccatum should contain not less than 99 per cent. of the pure anhydrous salt.

Alumini Sulphas, $Al_2(SO_4)_3 + 16H_2O$, should contain not less than 99·5 per cent. of the pure salt.

Ammonium Salts.—The chemical formula for ammonii carbonas is given as $C_2H_{11}N_3O_5$, (the atoms being grouped) instead of the elongated NH_4HCO_3, $NH_4NH_2CO_2$; the latter is, however, the better way of writing the formula, in that it shows the constitution of the commercial salt more readily to be a mixture of *Ammonium Bicarbonate* and *Carbamate*. The salt should contain 97 per cent. of the above mixture, and should yield not less than 31·58 per cent. of ammonia gas. For the assay, the residual titration process is employed, litmus being employed as indicator instead of rosolic acid. The other ammonium salts are as before.

Antimonii et Potassii Tartras is the only official salt of antimony.

There are a few minor changes in the tests. The tannic acid test is given, the introduction of which is a good one, in that it reminds one of the fact that tannic acid is an antidote to antimony. The volumetric assay is slightly though advantageously modified. The salt should contain not less than 99·5 per cent. of pure salt, against 100 per cent. in the old U.S.P.

Aqua Ammoniæ.—The volumetric assay directs 3 c.c. of ammonia water be accurately weighed in a weighing bottle, 50 c.c. of distilled water added and then titrated with normal sulphuric acid V. S., using litmus or methyl orange as indicator. In the old process rosolic acid was used.

Aqua Hydrogenii Dioxidi.—As previously stated, no official process for the preparation of this compound is given. There is no important change either in the tests for identity or impurities or in the assay process. The explicit directions given in the old Pharmacopœia as regards the expressing of the results of the analysis in grammes of absolute hydrogen dioxide and grammes and volume of available oxygen are omitted.

Silver Salts.—Outside of those previously noted there are no important changes in the silver salts. An improvement in the method of assaying is, however, worth noting. In this the silver salt, dissolved in a prescribed quantity of distilled water (not "water" as before), is treated with a measured excess of tenth-normal sodium chloride V. S., and, after the addition of 3 drops of potassium chromate, titrated with tenth-normal silver nitrate V. S., to a permanent red color. In the old Pharmacopœia the silver salt was titrated with the sodium chloride V. S., until complete precipitation resulted. The proper performance of this required that the precipitate be allowed to settle after each addition of the sodium chloride solution in order that one could see if its further addition produced any more precipitate; thus much time was consumed in waiting.

Aurii et Sodii Chloridum.—The gravimetric assay process of the old Pharmacopœia is replaced by a new process, which latter depends upon reducing the gold to the metallic state by boiling its alkaline solution with hydrogen dioxide, and weighing the resulting precipitate after washing and ignition.

Bismuth Salts.—There are two new bismuth salts—the subgallate and the subsalicylate. The bismuth salts are assayed gravimetrically by reduction to bismuth oxide. The presence of arsenic as an impurity is detected by Bettendorf's test.

Calcium Salts.—A definite standard of purity is assigned in the case of each, but no assay process is given except in the cases of calx chlorinata and of calx sulphurata. The latter is described as in the old Pharmacopœia as "a mixture containing at least 60 per cent. of calcium sulphide (CaS) together with unchanged calcium sulphate ($CaSO_4$) and carbon in varying proportions." The new process appears to be more satisfactory.

Creta Præparata is described as native calcium carbonate, freed from most of its impurities by elutriation. It is also described as being insoluble in water and in alcohol but soluble in acetic, nitric, or hydrochloric acids with copious effervescence, leaving not more than a *trifling* residue. When heated to full redness it gradually loses carbon dioxide and is converted into calcium oxide. Thus a very indefinite purity standard is given, "trifling residue" is a relative amount of residue, and may mean more or less. Further than above quoted, no tests for identity or for presence of probable impurities are assigned. In view of the fact that Creta præparata is largely used internally and enters into Hydrargyrum cum creta and Pulvis creta compositus, definite tests for impurities as were given in the U.S.P. of 1890 should have been continued. Tests for magnesium, iron, sulphate, and barium were given in the 1890 Pharmacopœia.

Cerium Oxalate.—This salt, although still prescribed, has lost favor to a considerable extent because of its unreliable medicinal action. The commercial salt is not pure cerium oxalate, in fact, the Pharmacopœia describes it as consisting chiefly of a mixture of the oxalates of cerium, didymium and lanthanum, and of other rare earths. No standard of purity is assigned, but numerous tests for impurities are given. The chemical formula, $Ce_2(C_2O_4)_3 + 9H_2O$, which was given in the 1890 Pharmacopœia has been very properly omitted.

Cupri Sulphas is the only official copper salt. It should contain not less than 99·5 per cent. of the pure salt.

Iron Salts.—Ferri iodidum saccharatum, ferri lactas and ferri valerianas, also the liquors ferri acetatis, citratis, and nitratis have been dismissed.

Ferri Chloridum should contain 22 per cent. as against 20 per cent. of metallic iron in the form of chloride, the chemical formula is (perhaps accidentally) omitted, though we find it under Liquor ferri chloridi. The latter is prepared in the same manner as before,

but is 3 per cent. stronger in the 1890 U.S.P. than in the present. The ferric chloride in the present Pharmacopœia is obtained by evaporation of the liquor. The volumetric assay is the same as before except that instead of weighing for analysis 0·56 gramme of the salt 1 gramme is taken, dissolved in 100 c.c. of water and 55.5 c.c. of this solution taken for analysis.

No method for the preparation of any of the scale salts is given.

Ferri et ammonii sulphas has the formula $FeNH_4(SO_4)_2 + 12H_2O$.

Ferrum Reductum.—A new assay method for this substance has been introduced. In the method of the old pharmacopœias mercuric chloride was digested with a weighed quantity of the reduced iron. This converted the iron into ferrous chloride, and was then titrated with decinormal potassium permanganate V. S. to permanent red color. To confirm the assay it was recommended to decolorize the solution with a few drops of alcohol, then to add 1 gramme of potassium iodide and digest for half an hour, cool and titrate with decinormal sodium thiosulphate in presence of starch as an indicator. This method gave very satisfactory results, but the new official method which was devised by E. Schmidt (Proc. Soc. German Naturalists and Physicians, September, 1897) and which is official in the new German Pharmacopœia, is considered the most reliable and up-to-date.

The New Assay Method is as follows: A definite weight of pure iodine, say 2·6 grammes is introduced into a flask with 6 c.c. of water, 2 grammes of potassium iodide, and 0·555 gramme of reduced iron; the flask is securely stoppered and set aside for one hour. Then water is added to make 100 c.c. Of this solution 25 c.c. is taken and titrated with tenth-normal sodium thiosulphate V. S. until a brown color is discharged, and the calculation made.

The iodine reacts with the pure iron, forming ferrous iodide as per equation $Fe + 2I = FeI_2$, but does not react with the iron oxide present. The uncombined iodine is then found by titration with the thiosulphate V. S. and from this it is easy to calculate the quantity of iodine which combined with the iron present (251·8 grammes of iodine represent 55·5 grammes of iron).

Reduced iron should contain not less than 90 per cent. of pure metallic iron. Directions for detecting limit of sulphide and for arsenic are given; the modified Gutzeit's test for the latter being employed.

Mercury Salts.—Definite purity standards are assigned in each case, but no assay method is given.

In the case of *Hydrargyri Chloridum Mite* a new test for the presence of mercuric chloride is recommended, namely, 2 grammes of the mild chloride are shaken with 20 c.c. of ether, filtered, the filtrate evaporated, distilied water added, and the solution tested first with silver nitrate T. S., and then another portion with ammonium sulphide T. S. This test depends upon the solubility of mercuric chloride in ether, and the insolubility of the mild chloride in the same menstruum. The test for mercuric chloride in calomel, given in the old Pharmacopœia, depended upon dissolving it out with water or alcohol, and treating the solution with hydrogen sulphide T. S., or silver nitrate T. S. The new test is a much more delicate one. The detection of *other soluble impurities* is, however, a much more complicated procedure than was the old, and its results probably not more reliable. Arsenic is tested for by the modified Gutzeit's test.

Liquor Calcis is assayed by titration with tenth-normal sulphuric acid V. S.. instead of as before with decinormal oxalic acid V. S.

Liquor Ferri Chloridi now should contain 29 per cent. of the anhydrous salt ($FeCl_3$), corresponding to 10 per cent. of metallic iron, while formerly it contained 37·8 per cent. of the anhydrous salt, corresponding to 62·9 per cent. of the crystallized salt, or to about 13 per cent. of metallic iron. The method of preparation is the same as before, but smaller quantities of the substances are taken.

Liquor Ferri et Ammonii Acetatis contains double the former quantities of the ferric chloride and diluted acetic acid and 2½ times as much of solution of ammonium acetate.

Liquor Plumbi Subacetatis.—This solution is of the same strength as before, though 10 grammes more of each of the ingredients are taken. The old assay method was one of direct titration with normal sulphuric acid V. S., using methyl orange as an indicator. This assay could be quickly made, and the results were sufficiently accurate for a substance which is used almost entirely for external application. The new method, while more scientific and of greater accuracy when performed by one accustomed to such work, is, however, entirely too cumbersome for use by the pharmacist in assaying a solution in which a trace more or less of the active ingredient would be of no moment. The assay directions are, if 10 grammes of the

solution be diluted with previously boiled distilled water to measure 100 c.c. and 13·6 c.c. of this solution be added to 35 c.c. of tenth-normal oxalic acid V. S., contained in a graduated cylinder, and, after thoroughly shaking, the mixture be diluted with distilled water to measure 50 c.c. Then after shaking again and the precipitate has settled, 10 c.c. of the clear solution, after diluting with about 50 c.c. of water and adding 5 c.c. of sulphuric acid, should require not more than 2 c.c. of tenth-normal potassium permanganate V. S. to produce a permanent pink tint. This method is that of Hempel, and depends upon precipitating the lead as oxalate, using a measured excess of standard oxalic acid solution. Then after acidulating with sulphuric acid, titrating for the excess of oxalic acid with standard permanganate solution. By deducting the quantity of tenth-normal permanganate solution required from the quantity of tenth-normal oxalic acid V. S. taken, the quantity of the latter, which reacted with the lead, is obtained, and by a calculation the weight of lead subacetate present is found.

The reactions involved are illustrated by the equations:

(1) $Pb_2O\,(C_2H_3O_2) + 2H_2C_2O_4, 2H_2O = 2PbC_2O_4 + 2HC_2H_3O_2$
$3H_2O$.

(2) $5H_2C_2O_4 + 3H_2SO_4 + 2KMnO_4 = K_2SO_4 + 2MnSO_4 +$
$10CO_2 + 8H_2O$.

Liquor Potassii Arsenitis is assayed as before, except that the solution instead of being boiled with the sodium bicarbonate is slightly acidified with diluted hydrochloric acid and then made alkaline with sodium bicarbonate before titrating with the standard iodine V. S. Starch is not employed as indicator.

Lithium Salts.—Definite standards of purity are given in each case, as well as sufficient and satisfactory tests for the detection of possible impurities.

The benzoate and salicylate are assayed by igniting in a porcelain crucible, together with some powdered anhydrous ammonium sulphate and the residue weighed. These salts were formerly ignited and the residue, consisting of lithium carbonate and carbon, dissolved in water and titrated with normal sulphuric acid V. S. The results by this volumetric method were usually a little too low. The new method may prove more satisfactory. The same volumetric method was formerly also employed in the assay of the

citrate, but was likewise discarded, and a gravimetric method, depending upon the conversion of lithium sulphate, is introduced.

Lithium Carbonate is assayed by residual titration; 0·5 gramme of the salt are dissolved in 20 c.c. of normal sulphuric acid V. S., and the resulting solution titrated with normal potassium hydroxide V. S.; not more than 6.6 c.c. should be required, methyl orange being employed as indicator. In the old Pharmacopœia the assay was a direct titration with normal sulphuric acid V. S. The new method is certainly the better one for this as well as for all other soluble carbonates.

Lithium Bromide is assayed in the same manner as it formerly was, the only difference being that instead of weighing 0·5 gramme of the salt and dissolving it in 20 c.c. of water; 1 gramme is dissolved in sufficient distilled water to make 100 c.c., and of this solution 20 c.c. (representing 0·2 gramme of the salt) are taken for analysis. The titration is done with tenth-normal silver nitrate V. S., potassium chromate being used as indicator.

Magnesium Salts.—Magnesii Oxidum and *Magnesii Oxidum Ponderosum* have been discussed earlier in this article; *Magnesii Carbonas* is approximately $(MgCO_3)_4\ Mg(OH)_2 + 5H_2O$. It should yield upon ignition not less than 40 per cent. of residue, of which not less than 96 per cent. should consist of pure magnesium oxide.

Theoretically, 482·26 grammes of the official magnesii carbonas should yield upon ignition 200·3 grammes of magnesium oxide. That means that 1 gramme of the carbonate should yield 0·407 gramme of the oxide. The U.S.P. requirement is that 1 gramme should yield when ignited 0·40 gramme of residue. It is further directed in the newly introduced assay that 0·400 gramme of recently ignited and cooled magnesium carbonate (*i. e.*, 0·400 gramme of MgO) be dissolved in 25 c.c. of normal sulphuric acid V. S. and the solution titrated with normal potassium hydroxide V. S.; not more than 5.8 c.c. of the latter should be required for neutralization, methyl orange being used as the indicator. The quantity of normal potassium hydroxide solution used is deducted from the 25 c.c. of normal sulphuric acid V. S. added, leaving 19·2 c c., which is the quantity of normal sulphuric acid V. S. which went into combination with the 0·400 gramme magnesium oxide taken for analysis; each cubic centimetre of the acid V. S. representing 5 per cent., or 0·02 gramme, of pure magnesium oxide. The equation is:

$$MgO + H_2SO_4 = MgSO_4 + H_2O.$$

$$\begin{array}{llll} 2)\underline{40{\cdot}06} & 2)\underline{98.} & & \\ 20{\cdot}03 & 49 & = & 1000 \text{ c.c. normal V. S.} \\ {\cdot}02003 \text{ gramme} & & & 1 \quad " \quad " \quad " \end{array}$$

Magnesii Sulphas should contain not less than 99·7 per cent. of pure magnesium sulphate ($SO_2O_2Mg + 7H_2O$); no method for assaying is given. Tests for limit of sodium and for chloride have been discarded. The time-limit test for heavy metals and modified Gutzeit's test for arsenic are used.

Lead Salts.—Very few and minor changes are noted. The test for presence of *nitrate* in *Plumbi Iodidum* is a decided improvement upon the old test. In the present test 1 gramme of the salt is heated with 5 c.c. of water, the liquid filtered into a test-tube of the capacity of 40 c.c., 5 c.c. of potassium hydroxide T. S. are added and 0·2 gramme aluminum wire introduced. Then a pledget of purified cotton is inserted in the upper part of the test-tube, and a piece of moistened red litmus paper placed over the mouth of the tube. The tube is now heated on a water-bath for fifteen minutes. No blue coloration of the paper should be discernible.

Potassium Salts.—Definite standards of purity are assigned in each case. The assay processes are practically the same as in the old Pharmacopœia, though slightly modified; half-normal sulphuric acid V. S. being employed for neutralization instead of the normal acid solution. Potassium cyanide is assayed by a new method, *i. e.*, that described under acidum hydrocyanicum. As regards the tests for identity it is noted that sodium cobaltic nitrite T. S. has been discarded as a test for potassium, and sodium bitartrate T. S. and tartaric acid are used instead. The only exceptions are in the cases of potassium bitartrate and potassium cyanide, in which sodium cobaltic nitrite are still used, and in the case of Rochelle salt in which acetic acid is employed to precipitate the potassium as bitartrate. In the case of potassium chlorate, platinic chloride T. S. is used in addition to the tartaric acid T. S. The reaction to litmus paper is stated in the case of the potassium salts as being alkaline or feebly alkaline, potassium bitartrate is acid, and several of the salts are neutral.

As to the tests for impurities, "the time limit test for heavy metals" is recommended in most cases, instead of the old sulphide

test; and, strange to say, tests for chlorides, sulphates and for sodium are omitted in nearly every instance. The other tests for impurities remain about the same as before.

Potassium hypophosphite is headed with a precaution notice against triturating or heating the salt with nitrates, chlorates or other oxidizing agents.

Potassii citras effervescence is differently prepared than formerly. See the Pharmacopœia.

Sodium Salts.—Very few changes are noted in the sodium salts, aside from those spoken of earlier in this review. Definite standards of purity are assigned in the case of each salt. The assay processes given are mostly the same as before; the exceptions being sodium hypophosphite, in which the assay is omitted; sodium sulphite, sodium bisulphite, and sodium nitrite described below.

As regards the tests for impurities no remarkable changes are noticed, except that as in the potassium salts, the tests for chloride, sulphate and calcium are omitted. The "time-limit test for heavy metals" is employed except in sodium chlorate, in which the ammonium sulphide test is used. Arsenic is detected by the "modified Gutzeit's test."

A new assay process for *Sodii Nitris* is introduced to replace the gasometric method of the old Pharmacopœia. In the performance of the latter method a nitrometer was required, and inasmuch as this instrument is rarely found in drug stores, the assay was seldom made by the pharmacist. The new method is altogether a volumetric one, and the assay can be accomplished readily and without the use of any unusual instruments. It depends upon the reaction between sodium nitrite and potassium permanganate in the presence of sulphuric acid. The nitrite is oxidized to nitrate and the permanganate decomposed as the equation shows:

$$5NaNO_2 + 2KMnO_4 + 3H_2SO_4 = 5NaNO_3 + K_2SO_4 + 2MnSO_4 + 3H_2O$$

In detail the process is as follows: Thirty c.c. of tenth-normal potassium permanganate V. S. are diluted with about 150 c.c. of distilled water. Then 5 c.c. of sulphuric acid and 10 c.c. of a solution containing 0·1 gramme of sodium nitrite are added; the liquid is then warmed to 104° F. and allowed to stand for five minutes. It is then titrated with tenth-normal oxalic acid V. S. until decolor-

ized. Not more than 3·75 c.c. should be required. This amount deducted from the 30 c.c. of permanganate V. S. added, gives the quantity of the latter which was decomposed by the 0·1 gramme of sodium nitrate taken. Each cubic centimeter represents 0·0034285 gramme of pure sodium nitrite.

Example: 30 c.c. — 3·75 c.c. = 26·25 c.c.

$$26{\cdot}25 \text{ c.c.} \times 0{\cdot}0034285 = 0{\cdot}0899 + \text{gramme.}$$

$$\frac{0{\cdot}0899 \times 100}{0{\cdot}1} = 89{\cdot}9 \text{ per cent.}$$

The *Assay* of *Sodii Sulphis* is changed as to the manipulation. In the old Pharmacopœia a weighed quantity of the salt dissolved in water was titrated direct with decinormal iodine V. S., using starch as the indicator. The new procedure is a great improvement upon this. In it the sodium sulphite in fine powder is added to 50 c.c. of tenth normal iodine V. S. contained in a glass-stoppered bottle of about 100 c.c. capacity. After standing for about one hour with frequent shaking, the mixture is titrated with tenth-normal sodium thiosulphate to discharge of color.

The *Assay* of *Sodii Bisulphis* is the same as above.

Strontium Salts.—The lactate has been replaced by the salicylate. The bromide and iodide are still official.

The starch test for iodide, in strontium bromide is replaced by the chloroform head test, and the "time-limit test for heavy metals" takes the place of the sulphide test. The presence of barium (because of its poisonous nature) as an impurity in strontium salts is very important to detect. The new test is a decided improvement over the old one. The tests for identity are the same as before. The assay of strontium iodide is a residual titration process (that of Volhard). The iodide is treated with measured excess of tenth-normal silver nitrate V. S., the mixture acidified with nitric acid and titrated with tenth-normal potassium sulphocyanate V. S., using ferric ammonium sulphate as indicator.

Zinc Salts.—No remarkable changes are observed, except that zinci phenolsulphonas and zinci stearas have been added; that zinci phosphidum has been dismissed; and that zinci valerianas is now called zinci valeras.

THE EIGHTH DECENNIAL REVISION OF THE U. S. PHARMACOPŒIA FROM A PHYSICIAN'S STANDPOINT.

By M. Clayton Thrush, Ph.M., M.D.
Instructor in Pharmacology and Therapeutics, Medico-Chirurgical College, Philadelphia.

The United States Pharmacopœia of 1900, more properly termed the Eighth Decennial Revision, became the official standard on September 1, 1905.

The present revision has been the most thorough that has ever been attempted, and more time has elapsed than ever before in its preparation.

For one to attempt to review all the important changes as viewed by the physician, would be futile in the short time allotted in a meeting of this kind, and I shall endeavor merely to consider some of the more important changes.

One hundred and seventeen articles have been added and 107 dismissed and the strength of a number of important preparations has been altered, yet how many physicians and pharmacists throughout the United States to-day are familiar with these changes, notwithstanding that over two and a half months have elapsed since its recognition as the official standard?

In order to speak authoritatively on this subject, I have inquired of a number of pharmacists as to what extent the physicians are prescribing the new official preparations; and the answer has been in every instance, that they have not received any prescription in which the new nomenclature or preparations were used, with a few minor exceptions. Now where is the trouble? To keep pharmacists and physicians ignorant of what is being done, and then suddenly project upon them innumerable changes, many of them radical, some of them dangerous and nearly all of them important, is to cause them an embarrassment which is as great as it is unnecessary. Why come upon them with the unexpectedness of the thunder-clap? Why drive them into consternation and almost paralysis when it would be so easy to prepare them for what is coming?

At best it is a slow process for a huge pharmaceutical and medical body to adapt itself to pronounced changes, and we may now expect more or less confusing and many amazing if not dangerous mistakes for a year or two, or perhaps longer, until the process of adaptation has been fairly completed. It takes the pharmacist some time to

learn the changes himself; he must also do much of the work of apprising the physicians of them; he has to modify his own stock of medicaments and suffer much inconvenience if not actual loss; he is compelled to skip with agility between the old and the new pharmacopœias until his physicians have adapted themselves thoroughly to the change. I do not believe that 1 per cent. of the physicians throughout this country to-day are ordering the new preparations, and but few pharmacists have them in stock. Allow me to illustrate. A week ago I gave a woman a note to go to the drug store and purchase 10 cents' worth of liquor antisepticus for a mouth wash, and she tried four of our leading drug stores and they all stated that they had never heard of such a thing, yet these gentlemen pose as progressive, up-to-date pharmacists.

A prescription of mine for liquor cresolis compositus was taken to another drug store a few days ago, and to my surprise the druggist did not have any in stock, yet the Pharmacopœia has been operative for over two months. In another prescription compound tincture of gambir was ordered, and later in the day the pharmacist telephoned to find out what this ingredient in my prescription was, and where he could obtain it, as he had not the remotest idea as to what it was.

These pharmacists are college graduates. Surely they have not obeyed the precepts taught here within this noble institution, and if other physicians, who have been ordering these preparations, have had similar experiences, they will certainly not feel inclined to prescribe them.

It is your duty as active and energetic pharmacists to familiarize yourself with the new Pharmacopœia, and make up the new preparations and present the physicians in your locality with samples of the same, with an explanatory note in regard to each of them. Druggists all over the country have shown commendable enterprise in issuing circulars and booklets to the physicians in their territories, explaining and describing the important changes. I trust that you are doing the same. To my mind these two suggestions are the true remedy to the present attitude of the medical profession towards the new Pharmacopœia.

Let us now consider the important changes as viewed from the physician's standpoint.

Under *Medicated Waters*, aqua hamamelidis has been added, which will prove of great value, as it contains 15 per cent. of alcohol,

whilst a number of the so-called distilled extracts of witch hazel on the market contain only 3 to 5 per cent. of alcohol.

Under the *Infusions*, one has been dismissed, viz., infusion of cinchona, which was rarely prescribed, hence a wise dismissal.

The remaining *Decoctions* have been dismissed, and may they ever rest in peace, as they merely occupied space in the Pharmacopœia.

Four important *Solid Extracts* have been added, two being used quite extensively (cascara and sumbul), whilst ten have been dropped, none of which were prescribed to any extent. The important class of *Fluidextracts* has been decreased by three, thirteen added and sixteen dismissed, and the list as a whole will be commended. The term "*fluidextractum*" as one word is an important change in nomenclature, which is only of advantage in separating the solid and fluidextracts in the pharmacopœia, and it is of no particular advantage to the prescriber, unless he is careless about using the term "fluidum" after the name of the drug. The group *Syrups* has been wisely altered. The compound syrup of the hypophosphites will be hailed with delight, and it will supplant a number of proprietary preparations of similar composition. Syrups of garlic, althæa and raspberry have been dropped, as they all ferment readily, and the syrup of the hypophosphites with iron is an unnecessary preparation.

Three *Tinctures* have been added, one of which, compound tincture of gambir, has been added to supplant the compound tincture of catechu, as this drug has been of variable composition, and often substituted. The eleven dismissed were all but comparatively little used.

Under the *Medicated Wines*, wine of coca will be extensively used, whilst wine of colchicum root, though largely prescribed, can be easily dispensed with, as the wine of the seed has an identical action.

Two important *Elixirs* have been added and one dismissed. Elixir adjuvans, as the name implies, is an adjuvant or vehicle, whilst the elixir of iron, quinine and strychnine phosphates is a most valuable tonic combination, and one of the most commonly used preparations in the pharmacopœia, and it should have been official ten years ago. The elixir of phosphorus has been properly discarded, as it was an undesirable preparation.

The list of *Emulsions* has been wisely enhanced by the addition of two new emulsions containing cod-liver oil—the one plain and the other containing the hypophosphites, as there have been innumer-

able preparations on the market containing cod-liver oil, and so many of these were of little therapeutic value. The great advantage of all pharmacopœial preparations over similar proprietaries is that the physician is assured of a preparation of uniform and definite strength, and one of which the exact composition (including vehicle and flavoring) is known; this latter is of particular importance, as so many proprietaries give the active ingredients, but not the vehicle, which is often designated as "aromatics," and it is often important to know the latter, especially in certain gastric disturbances. The emulsion of oil of turpentine is likewise a good addition, and will be generally accepted. Emulsion of ammoniac has been placed on the "dump heap," and deservedly so.

The *Liniments* have only been affected by dismissing compound mustard liniment, which was rarely prescribed.

The number of official *Glycerites* remains constant, as the glycerite of iron, quinine and strychnine phosphates has been added, this being similar to the elixir, but more concentrated, and now used to prepare the official syrup. The glycerite of the yolk of egg has been dismissed. It is unfortunate that the Revision Committee did not add an official pill containing iron, quinine and strychnine phosphates, as they are popularly prescribed in this form, owing to the marked bitter taste of the liquid preparations.

The *Spirits* have been reduced by five, four of which were used for flavoring and one (spirit of phosphorus) was rarely used medicinally.

The number of official *Liquors* remains the same by the addition and dismissal of four. The four dismissed had but little application (the acetate, citrate and nitrate of iron and the sodium silicate); all of these were rarely used, and supplanted by better preparations.

Of those added all are important. Liquor antisepticus resembles the Listerine class and kindred antiseptic solutions, and should have a large demand, as it is less expensive. The compound solution of cresol should likewise come into popular favor as an antiseptic for douches and irrigations, having the same application as creolin and lysol, and it would not be amiss to call your attention to a feature of this preparation which should have been noted by the Revision Committee, viz., that when the ingredients are mixed this preparation should stand at least two weeks before being used, or heat used after mixing, as it requires either of these procedures to complete the saponification between the potassium hydroxide, linseed oil

and cresol. Otherwise the preparation will be too irritating in its action, owing to the free cresol present. The solution of formaldehyde is a valuable disinfectant solution, and the concentrated solution of sodium phosphate will have an extensive application.

Three new *Oleates* have been added, being solutions of the respective alkaloids atropine, cocaine and quinine in oleic acid, and their use should be encouraged, as they are readily absorbed by the skin. Oleate of zinc has been discarded, as the ointment is chiefly used.

The number of official *Pills* has been reduced by one, and all three of those dismissed were rarely ordered, whilst the two new formulas are valuable combinations, and will have extensive use, the one containing aloin, belladonna and strychnine with ipecac, the other podophyllum, belladonna and capsicum. It is unfortunate that the popular aloin, belladonna and strychnine with cascara was not likewise added.

Mass of copaiba has been dismissed, a good riddance from the pharmacopœia.

The official *powders* remain the same in number, as antimonial powder has been dismissed, whilst the compound acetanilid powder has been added. This will at once be recognized as a substitute for the hundreds of proprietary "headache powders" on the market, some of which are quite dangerous in character, and almost daily the lay press records cases of sudden death from their indiscriminate use.

Under the group *Troches*, only one addition—troches of gambir, and seven have been dismissed. If the Committee had only discarded the remaining nine official troches they would have rendered a good service, as they are rarely ever used.

Under the *Ointment* group four have been added, two of which will be valuable, viz., ointment of boric acid and zinc stearate. A diluted mercurial ointment one third weaker than the present one was entirely unnecessary. The three dismissed were but little used.

Six less official *Plasters*, and this must be commended, as the art of plaster making is practically a lost art with the pharmacist, as they can be prepared more economically by machinery. Adhesive plaster has been added, as it is largely used in surgical work.

Only one official *Charta* remains, the charta potassii nitratis being omitted.

Five *Volatile Oils* were discarded and all wisely, three being used exclusively in perfumery. The official volatile oils are now required

to be of a certain definite strength as determined by assay. This was a wise measure and one that will be approved by all.

Four new *Fats* have been added and one dismissed. Pure wool fat without the addition of water is preferable in certain combinations. Paraffin will be used to "stiffen" ointments and cerates. White petrolatum is of especial value, in ointments where a pure base is required. Compound resin cerate, or Deshler's salve, certainly deserves admission from the standpoint of popularity if nothing more.

Under the Ferments, malt and an extract of malt have been added, whilst saccharated pepsin has been dropped.

Resin of copaiba has been dismissed, as the oleoresin is more desirable.

Strophanthin and picrotoxin represent the change in *neutral principles*, the former being quite *toxic* if pure. Dose is $\frac{1}{200}$ grain. The latter has been dismissed.

A number of important *Volatile Liquids* have been added, whilst deodorized alcohol has been dismissed, as its important use was in perfumery.

The important group of *Alkaloids* has been increased by nine, three being dismissed, and all these being alkaloids from cinchona. These alkaloids are all of decided value, and should have an extensive use. Scopolamine hydrobromide is becoming greatly used in producing anesthesia, and is usually combined with morphine.

Four new *Acids* have been added and one dismissed (crude carbolic acid), and those added are all desirable preparations.

Four new *Animal Products* have been added and two of but little value dismissed. The desiccated suprarenal and thyroid glands, being often used, will have a demand.

Under the *Crude Drug* schedule, ten have been added and thirty-seven have been dismissed. Berberis, gambir, sabal and scopola are the new crude drugs with which we should all be familiar.

A new class has been added, represented at present by one member, viz., the *Serums*. Serum antidiphthericum, or diphtheria antitoxin, has been made official, and this will meet with the hearty approval of the medical profession, as it has proven itself of the greatest value in the treatment of diphtheria.

Another new group is the *Cataplasmæ*, or poultices, which have one representative official. Cataplasm of kaolin is a substitute for

several commercial preparations dispensed in air-tight cans, and highly vaunted as antiphlogistics. It is the duty of the profession to prescribe these preparations, which have been wisely selected and made official, and thus render obsolete a number of proprietary preparations which are filling the coffers of certain manufacturers at the expense of the patient.

In the last pharmacopœia two *Synthetic Drugs* were official (Acetanilid and Salol) and eleven new ones have been introduced, making a total of thirteen. Some of these were formerly patented preparations upon which the patent has expired. They are all valuable drugs, but the Pharmacopœial Committee erred in adopting the chemical name as the official name, as these names are quite long and difficult to remember; in fact, a number of physicians have told me that they did not intend to worry themselves with such names.

In the latest issue of the Pharmacopœia, four true *Patent Medicines* have been introduced, viz., phenacetin, sulphonal, trional and aristol, all of which are largely used, notwithstanding their expensiveness, and the patents on these drugs will not expire until next year for two, and three years hence for one. They have all been adopted under a condensed chemical name, which very few physicians will ever use; the majority will adhere to their patent name.

Gentlemen, we are suffering a great injustice by paying such outrageous prices for these patents when they can be purchased in other countries for about one-third their present price. Antipyrine is a good example of the enormous profits in this class of preparations. At patent price antipyrine cost $22.40 per pound (wholesale), now $3.00, and yet a reasonable profit from its manufacture.

The same proportionate prices will apply to these other drugs after the patent expires.

These are true patent medicines, as by a patent medicine we mean one whose mode of preparation in detail is patented, and no one but the firm controlling these rights can manufacture the same until the patent expires. A patent medicine is, therefore, a *non*-secret preparation; in fact, opposed to the so-called "patent medicines," such as Lydia Pinkham's Vegetable Compound, the formulæ of which are secret and which should be called "secret nostrums." Hence the term "patent medicines" should not be applied to them, as any one can readily see.

I do not think that the medical profession favors the adoption of patent medicines in the Pharmacopœia.

A number of changes have been made among the *salts* of the *metals*, all of which have been desirable, and will be heartily approved by the medical profession.

A number of important changes in *Nomenclature* have been adopted which are acceptable and an improvement, as they are more comprehensive.

The adoption of a "*Purity Rubric*" for the official chemical substances and the increasing of the number of *Assay Processes* for active drugs containing alkaloidal constituents, are certainly a step in the right direction, and one that will be commended by every one. Assay processes now apply to fourteen drugs, whilst in 1890 only three were assayed. The Pharmacopœia should go a step further and require them to be *physiologically tested.*

Other desirable features are: the adoption of an average dose for each drug which is not obligatory; the adoption of a standard unit for atomic weights with hydrogen as 1; a new standard of 25° C. (77° F.) for specific gravity, and the elimination of synonyms from the Pharmacopœia.

A few changes have been made in chemical and botanical nomenclature, but the essentials are the same.

The adoption of the recommendations of the International Pharmacopœial Conference, held at Brussels in September, 1902, is most desirable, and as a result potent tinctures are 10 per cent. and others 20 per cent. The only two changes that are likely to cause trouble are the reduction of tinct. aconite (formerly 35 per cent.) and veratrum viride (formerly 40 per cent.) to 10 per cent., but these can be easily remembered.

It has been our aim to enumerate the important changes in the Pharmacopœia as viewed by the physician from his standpoint, and if anything has been said that will tend to popularize the Pharmacopœia on the one hand, or to increase that spirit of fraternalism and co-operation that should exist between the two kindred professions of medicine and pharmacy, we shall feel amply repaid for our efforts.

BIOGRAPHICAL SKETCH OF PROF. A. TSCHIRCH.

By A. B. Stevens.

Prof. Alexander Tschirch was born October 17, 1856, in Gieben, Prussia. He began his pharmaceutical career as an apprentice in 1873. In 1878 he studied one semester in Berne, Switzerland, and then continued his studies in Berlin under A. W. Hoffmann and Helmholtz, finally completing his work for the degree of Doctor of Philosophy at Feiburg, B., in 1881. The subject of his dissertation was "Ueber einige Beziehungen des anatomischen Baues der Assimilationsorgane zu Klima und Standort." On completion of his university course he became assistant to Dr. Ziurek, then Public Analyst in Berlin, and later assistant in botany under Professor Pringsheim.

In 1885 he was appointed lecturer in chemistry and botany in the University of Berlin. In this same year he married the accomplished daughter of Dr. Ziurek. She speaks and reads German, French and English freely. They have two lovely daughters, of whom the Professor is very fond. The pharmaceutical world may later hear from the younger daughter, as she is inclined to follow in her father's footsteps.

In 1888 Professor Tschirch received a commission from the Royal Academy of Science of Berlin, and went to India, Ceylon and Java, where he made a study of medicinal plants, collecting many specimens and made numerous photographs. Many of these have been of inestimable value to him and his students in pharmacognosy, as they cover a wide range of subjects, from the planting of the seedlings to the full-grown tree; those upon cinchona, cinnamon and tea are especially interesting. (See list of publications.)

In 1890 he left Berlin to accept a call from the University of Berne, Switzerland, where he established a Pharmaceutical Institute with separate microscopical, chemical and pharmaceutical laboratories. This was the realization of his desire, to have a thoroughly equipped laboratory where he could conduct chemical as well as botanical investigations.

On leaving Berlin his students presented him with a large silver cup which he has put to a very unique use. Every student who receives the degree of Ph.D. from the Institute is invited to drink with him from this cup, and then the name of the newly-made doctor

is engraved on the cup. This cup now contains the names of students from the following countries: Switzerland, Germany, France, Russia, Finland, Norway, Sweden, Holland, Italy, Bulgaria, Roumania, Japan and the United States.

The publications of the Institute at present form six volumes, which have appeared principally in the *Schweiz. Wochenschr. für Chem. und Pharm.* and the *Archive der Pharmacie.*

Professor Tschirch is a very voluminous writer, his contributions upon various subjects number over 400 articles, a list of those written previous to 1895 may be found in "Gallerie hervorragender Therapeutiker und Pharmakognosten der Gegenwart," by B. Reder. Of those written since 1895 doubtless the best known are those upon Oxymethylanthraquinone bearing drugs.

His publications that have appeared in book form consist of:

"Grundlagen der Pharmakognosie," with Flückiger. 1885.

"Untersuchungen über das Chlorophyll." Berlin, 1884.

"Angewandte Pflanzenanatomie." Vienna, 1889.

"Wandtafeln für den Unterricht in der Pflanzenphysiologie," with Frank. 1889.

"Indische Heil- und Nutzpflanzen und deren Kultur," contains 128 illustrations. Berlin, 1892.

"Das pharmazeutische Universitätsinstitut und das academische Studium der Pharmazeuten in der Schweiz, Deutschland und Oestreich." Berne, 1891.

"Das Kupfer vom Standpunkte der gerichtlichen Chemie, Toxicologie und Hygiene." Stuttgart, 1893.

"Anatomischer Atlas der Pharmacognosie und Nahrungsmittelkunde," with Oesterle. 1893, 1898.

"F. A. Flückiger. Biographie." Berlin, 1895.

"Die Harze und die Harzbehälter." Berlin, 1900.

Professor Tschirch is a man of strong physique and capable of performing an endless amount of work with apparent ease. Besides being an active member of a number of chemical and pharmaceutical societies he is president of one of the pharmacy examining boards of Switzerland, of which there are four. He is vice-president of the commission for the revision of the "Pharmacopœia Helvetica," and one of its most active workers.

As a lecturer, he speaks distinctly and forcibly, frequently illustrating his lectures with colored crayon which he uses very effec-

tually. Indeed, he is quite an artist, having a fine collection of water colors of Swiss, German and Italian scenery which he has painted during his summer vacations. On one occasion, when he had a picture nearly finished, an American traveler offered him 50 francs for the painting. In this case his younger daughter had more of an eye to business than the Professor, for she asked "Why did you not take it? you could paint another."

In society he is usually the life of the company. He is a liberal entertainer, not only of his many friends in Berne, but also of his students. One of his favorite pastimes is to go with his class for a tramp over the mountains, or coasting down the beautiful mountains in winter. It is an inspiration to find a man who accomplishes so much and still finds time for recreation. It would be better for more of us if we would follow his example.

ANN ARBOR.

ON THE ORIGIN OF FUSEL OIL IN SPIRITS.[1]

By SAMUEL P. SADTLER, PH.D.

The growing importance of fusel oil, which was at one time a waste product in the spirit industry, but is now eagerly sought for, because of its importance as a solvent, and as a raw material for the manufacture of amyl acetate, another solvent of the greatest technical importance because of its solvent power for pyroxylin and use in artificial fruit ethers, has led to a number of experiments within recent years, with a view of finding out how the natural production could be increased, or, if possible, a means of producing it independently of the alcoholic fermentation.

A paper has just been read before the Society of German Naturalists and Physicians (the equivalent of our American Association for the Advancement of Science) at its annual meeting held from the 24th to the 30th of September, 1905, which seems to have definitely solved the question of its origin, and at the same time to have indicated the way by which an important industry may be started, and the valuable product obtained in larger amount and probably at a greatly reduced price.

The author, Dr. Felix Ehrlich, of Berlin, states his results as follows:

[1] From the *Chemical Engineer*, December, 1905.

The view that has prevailed generally since the time of Pasteur to the present, in connection with chemistry of fermentation and the origin of fusel oil was that fusel oil, or more especially its most important constituent, amyl alcohol, was formed in the fermentation from the sugar, by the action of bacteria, a view which seemed also to be confirmed by the more recent researches of Kruis and Rayman, Emmerling and others. At the same time, it never had been found possible, even with the aid of fusel-oil-forming bacteria which are found abundantly in nature, to produce fusel oil or amyl alcohol under the conditions of a normal fermentation.

The writer points out that all the theories hitherto held with regard to the fusel-oil formation have rested upon false premises and goes on to show that fusel oil in the ordinary fermentation is produced not from the sugar, but from the products of decomposition of proteid matter, such as the amido-acids, and, moreover, not by the action of bacteria, but under the influence of the vital activity of the yeast itself. The clue to this conclusion, based upon a long series of experiments, was given by the discovery of isoleucine, which the writer, somewhat more than two years ago, found in the last residues of the sugar industry, a strontian molasses residue, and which he subsequently has recognized as a most important product of decomposition occurring in all albumenoids along with leucine.

This isoleucine has shown itself in its constitution to be the first of the so-far known amido-acids with two asymmetric carbon atoms, of which the one is formed by the splitting of the carbon chain, and is, therefore, a methyl-ethyl-amidopropionic acid of the formula

$$\begin{matrix} CH_3\diagdown \\ C_2H_5\diagup \end{matrix} \overset{*}{C}H \,.\, \overset{*}{C}HNH_2 \,.\, COOH,$$

which stands in close relation to the optically active amyl alcohol, which latter can be built up from this by means of the aldehyde, the cyanhydrin reaction and saponification. That similar relations exist between the ordinary leucine and isoamyl alcohol, is shown in the following reactions, which, without further explanation, indicate the origin of this most important constituent of fusel oil.

$$\underset{\text{Leucine.}}{\begin{matrix} CH_3\diagdown \\ CH_3\diagup \end{matrix} CH \,.\, \overset{*}{C}H_2CHNH_2 \,.\, COOH} + H_2O \qquad \underset{\text{Isoamyl alcohol.}}{\begin{matrix} CH_3\diagdown \\ CH_3\diagup \end{matrix} CHCH_2 \,.\, CH_2OH} + NH_3 + CO_2.$$

$$\begin{matrix} CH_3 \diagdown \\ C_2H_5 \diagup \end{matrix} \overset{*}{C}H \cdot \overset{*}{C}HNH_2 \cdot COOH + H_2O = \begin{matrix} CH_3 \diagdown \\ C_2H_5 \diagup \end{matrix} \overset{*}{C}H \cdot CH_2OH + NH_3 + CO_2.$$

Isoleucine. Optically active amyl alcohol.

$$\begin{matrix} CH_3 \diagdown \\ CH_3 \diagup \end{matrix} CH \cdot CHNH_2 \cdot COOH + H_2O = \begin{matrix} CH_3 \diagdown \\ CH_3 \diagup \end{matrix} CH \cdot CH_2OH + NH_3 + CO_2.$$

Amidoisovaleric acid. Isobutyl alcohol.

Fermentation experiments with pure sugar and pure compressed yeast showed that in the fermentation upon the addition of leucine, inactive amyl alcohol, or on the addition of isoleucine optically active left-rotatory amyl alcohol was regularly developed in amount equivalent to that of the amidoacid which disappeared.

If *r*-leucine is fermented with sugar and yeast, the natural *l*-leucine is converted by the yeast into amyl alcohol, while the *d*-leucine remains behind almost unacted upon.

The writer explains from the foregoing facts, very simply, the formation of the single optically active constituent of fusel oil, namely, the optically active amyl alcohol from isoleucine of which one asymmetric carbon atom remains unattacked. Similarly, just as the optically active amyl alcohol results from the isoleucine, numerous other optically active compounds are derived in nature from the last named body, as, for example, with certainty, the widely distributed dextro-rotatory valeric acid.

This fusel-oil formation constitutes a new and very peculiar breaking down of albumen or of the amido-acids, which differs essentially from the well-known splitting of CO_2 from the amido-acids in putrefaction. In this case the yeast de-amidizes the amido-acids, as, for example, leucine in acid solution, by the action of a hydrolyzing ferment most probably at first to the corresponding oxyacid leucic acid, which then, in a manner analogous to the formation of alcohol from lactic acid by the splitting off of CO_2, is converted into amyl alcohol. The ammonia molecule which is set free in this de-amidizing is used by the yeast for albumen formation. By quantitative experiments, it can be established that the fusel-oil formation corresponds in the most exact way with the building up of the proteid material of the yeast, and for the conversion of a definite amount of the leucines into the corresponding amyl alcohols, a definite amount of sugar and yeast substances is necessary, which later becomes enriched thereby with nitrogen to a certain limit.

The writer called attention finally to the great technical import-

ance of the subject under discussion. It is true that the view hitherto prevailing that fusel oil was formed from the sugar, must be given up, but at the same time, the experiments of the writer showed that with proper readjustment of the relative amounts of the sugar and yeast it is possible to convert any amount of leucine that may be added to the fermenting mash into amyl alcohol, which can be later separated in the usual way without disturbing the conditions of the fermentation.

For the future manufacture of large amounts of fusel oil, the point of importance will be, therefore, to use the leucine, which is easily obtainable from all kinds of waste products, rich in proteid matter. The first in importance of these sources are the waste liquors from the strontian sugar-extraction process from which leucine crystallizes out directly; also the waste liquors of starch and glue manufacture, and horn and blood waste-products and other cheap proteid matter, which will be conveniently decomposed in advance by the action of acids or by fermentation.

It is to be hoped that by combination of the spirit industry, especially with the chemical and industrial manufacturing branches, a new and very remunerative branch of industry will be developed.

BOOK REVIEWS.

The Follies of Science at the Court of Rudolph II. By Henry Carrington Bolton, Milwaukee. Pharmaceutical Review Publishing Company, 1904. Price, $2.00.

This book was originally published as a serial in the *Pharmaceutical Review*, and was probably the last literary effort of its author, he having died in November, 1903, a little over a month after the appearance of the last installment.

Rudolph II was Emperor of Germany from 1576 to 1611, but he was more interested in art and science than in the affairs of State, which he entrusted largely to others. Unfortunately, however, Rudolph was of a superstitious and fanatical turn of mind and he was more concerned about the Elixir of Life and the Philosopher's Stone than the discovery of Kepler's laws or the truths of chemistry. For more than thirty years charlatans, who flocked to Prague, the seat of the Emperor, from all parts of Europe, continued to rise and

fall in the royal favor, until at last the treasury was emptied and the Emperor deposed—all of this despite the fact that the workers in Rudolph's laboratories were kept busy carrying on experiments in transmutation. It must not be supposed, however, that with so much experimentation nothing genuine was accomplished. This was the age of alchemy in Europe, and the author, mindful of its contribution to our knowledge of chemistry, mentions a number of the discoveries of the alchemists.

The chapters on "Rudolph's Physicians" and the "Rudolphine Academy of Medicine" ought to be of interest to pharmacists as well as physicians, a sixteenth century apothecary shop being described in one of them.

The book is attractive both in style and appearance, and furnishes an interesting chapter in the history of the pseudo-sciences of alchemy and astrology. F. Y.

OUTLINE OF A. O. A. C. WORK ON DRUGS, 1905.

At the Twentieth Annual Convention of the Association of Official Agricultural Chemists, 1903, a referee on medicinal plants and drugs was appointed. The object of this appointment was a collaborative, systematic study of the analytical methods used in determining the quality of crude plant drugs and products derived from them, with a view to improving and ultimately unifying the methods of analysis for such substances. The earnest co-operation of every chemist interested in this line of work is most cordially invited. The referee will take pleasure in sending samples for analysis to all who inform him on or before August 19th of their willingness to co-operate in the work. The lateness of this pamphlet is due to the delayed appearance of the new Pharmacopœia.

The work this year will again be confined to powdered opium, and the methods to be studied at this time are those considered to be among the best. Suggestions for new methods or improvements on old processes will be gladly received and given an impartial trial next year or at an earlier date if possible. The results should be in the referee's hands not later than October 1, 1905.

All calculations and solutions are to be based on the data contained in the eighth revision of the United States Pharmacopœia.

POWDERED OPIUM.

METHOD I.—UNITED STATES PHARMACOPŒIA, EIGHTH REVISION, WITH ADDITIONS.

Run two sets of duplicates on opium as received and report results for each set.

(1) Weigh the crystals in the inner filter counterpoised by the outer filter.

(2) Remove morphine crystals from filter paper, weigh on tared watch glass.

Mix the morphine of the two sets, powder same, test portions of the mixtures by the following methods and report per cent. of purity.

(3) Purity by lime-water method, United States Pharmacopœia, eighth revision, using 0·5 gramme of morphine.

(4) Place 0·5 gramme of morphine into a 120 c.c. Erlenmeyer flask, add 35 c.c. each of N / 10 potassium hydroxide and distilled water, agitate the contents of flask by a rotary motion at frequent intervals during half an hour, and proceed from this point as directed by the Pharmacopœia in determining purity of morphine by lime water.

(5) To 0·5 gramme of morphine add 18 c.c. of decinormal sulphuric acid, warm slightly to bring about a complete combination of the alkaloid and acid, add 50 c.c. of distilled water and 5 drops of cochineal solution. Then titrate back the excess of acid with N / 40 potassium hydroxide solution. Each cubic centimeter of decinormal sulphuric acid solution represents 30·09 milligrammes of crystallized morphine.

(6) Determine per cent. of inorganic matter in powdered morphine and report results.

METHOD II.—UNITED STATES PHARMACOPŒIA, EIGHTH REVISION, MODIFIED BY LAMAR.

Proceed as directed by Pharmacopœia to precipitation of morphine. To the 20 grammes of aqueous extract add 60 grammes of alcohol, cork flask, shake well for one minute, and set aside for thirty minutes, during which time the precipitated material should have completely subsided. Decant the clear supernatant liquid into a tared 250 c.c. evaporating dish, transfer the precipitate to a 7 centimeter

filter previously moistened with a mixture of alcohol (3 parts) and water (1 part). The last portions of the residue are transferred to the filter by using small portions of the above hydro-alcoholic solution. The filtrate is to be collected in the tared evaporating dish. Continue washing the residue and filter by dropping the alcoholic solution on the filter and the residue until the filtrate is no longer bitter. Add 33 c.c. of water to the contents of the evaporating dish and evaporate on water bath to 14 grammes, then proceed as directed by the Pharmacopœia.

Procure the same data for the morphine thus obtained as outlined under Method I.

METHOD III.—UNITED STATES PHARMACOPŒIA, EIGHTH REVISION, MODIFIED BY DOHME.

Place 10 grammes of the opium into a flask provided with a condensing tube and heat with 50 c c. of 75 per cent. alcohol for about ten minutes. Decant the fluid through a filter into a porcelain dish and extract the opium once more with 50 c.c. of the same alcohol. Filter, put filter back in the flask, heat the contents of the flask with 30 c.c. of the alcohol, filter again, and wash filter and residue with about 20 c.c. of the alcohol.

The combined alcoholic solutions are evaporated to a thin syrup, and then water is added until no more resin is precipitated. The aqueous fluid is filtered and after thorough washing evaporated to about 15 grammes.

Then proceed as given under opium in the United States Pharmacopœia.

Procure the same data for the morphine obtained as outlined under Method I.

METHOD IV.—STEVENS, WITH ADDITIONS.

Run two sets of duplicates.

Place 8 grammes of opium in a 120 c.c. Erlenmeyer flask with 4 grammes of fresh quicklime (not air slaked) and 20 c.c. of water, then agitate and stir with a glass rod until a uniform mixture results. Add 38 c.c. of water and stir frequently during one-half hour. Filter through a dry filter 10 centimeters in diameter and transfer exactly 30 c.c. to a 120 c.c. flask, add 8 c.c. of alcohol and 20 c.c. of ether, mix well, then add 1 gramme of ammonium chlorid, shake the

mixture well and frequently during half an hour, then set aside, in a cool place, for twelve hours.

Collect the morphine of one set of duplicates on counterpoised filter papers and the other set on a pledget of absorbent cotton, lodged in the throat of a funnel (both being dried to a known, constant weight) in the following manner: Remove the stopper carefully and transfer any adhering morphine to the flask. Pour the ethereal layer on the cotton or filter paper as the case may be, wash the contents of the flask with 20 c.c. more of ether, transfer to respective funnels, and, when this ether has passed through, pour the contents of the flask into the funnels. Remove the remaining adhering crystals to the proper funnels by means of small portions of morphinated water and wash the contents of the funnels with morphinated alcohol until the filtrate passes colorless. When the crystals have drained, dry to constant weight at about 60° C. Determine the weight of the morphine on the filter paper and cotton, respectively, and report results.

Remove morphine from filter paper, powder, determine purity of same by Method I, parts 3 and 4, using about one-half of the morphine for each operation.

Determine purity of morphine on cotton by treating with decinormal sulphuric acid as follows: Remove cotton and crystals from funnel by means of a small glass rod, drawn out to a curved point, to a beaker, rinse the crystals adhering to the funnel into the same beaker with 24 c.c. of decinormal sulphuric acid and 25 c.c. of distilled water, the latter following the former. Agitate the contents of the beaker until the crystals are dissolved and titrate back the excess of acid with N / 40 potassium hydroxid, using cochineal as indicator. Each cubic centimeter of decinormal acid represents 30·09 milligrammes of crystallized morphine. The morphine obtained by the above process represents 4 grammes of opium. From these data can readily be calculated the per cent. of morphine obtained, to which add 1.12 as a correction for the morphine remaining in the solvents used.

L. F. Kebler,
Referee, Medicinal Plants and Drugs.

United States Department of Agriculture,
Bureau of Chemistry, H. W. Wiley, Chief.
Washington, D. C., August 1, 1905.

SYNOPSIS OF THE PROCEEDINGS OF THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES.

The first meeting was called to order by President Kauffman, at Hotel Islesworth, Atlantic City, N. J., September 5, 1905.

The following institutions were represented:

Albany College of Pharmacy, Brooklyn College of Pharmacy, Cleveland College of Pharmacy, Chicago College of Pharmacy, Louisville College of Pharmacy, Maryland College of Pharmacy, Massachusetts College of Pharmacy, Michigan University School of Pharmacy, National College of Pharmacy, New York College of Pharmacy, Northwestern University School of Pharmacy, Ohio State University College of Pharmacy, Philadelphia College of Pharmacy, Pittsburg College of Pharmacy, Scio College of Pharmacy, St. Louis College of Pharmacy, Vanderbilt University Department of Pharmacy, Wisconsin University School of Pharmacy.

President Kauffman read the annual address which had for its subject "To Promote the Interests of Pharmaceutical Education." The following is an abstract of the President's address:

Attention is called to the doubts that existed at the time of the organization of the Conference as to its possible continuance, owing to the diversity in organization, extent and method of instruction in the teaching institutions of pharmacy. Now, as a result of a little persuasion here and a little concession there, the differences are gradually disappearing and the common ground enlarging until now we actually begin to move without fear of pushing each other off. It is safe to predict, said the speaker, that these points of unity will multiply much more rapidly in the future.

A few years ago the differences between the old schools and the university schools were plain and easily noted. To-day the distinction is not so conspicuously marked. The older schools are one after the other becoming affiliated with universities and coming under university influences, while many of those not so connected are strengthening their courses.

The passing of prerequisite laws by the States, and the fixing of entrance requirements and the length of courses of instruction by Boards of Pharmacy will have much to do in bringing the institutions teaching pharmacy to a more uniform plane.

While the individuals of the Conference may have played an

important part in fostering and bringing to pass this change of opinion, the Conference as a body has not taken the part it should in molding opinion and bringing about results. Now that the formative period has been passed, the efforts of the Conference should be directed outward, in an aggressive manner. There are four points, more or less connected, to which attention should be directed. First is publicity. A large majority of the pharmacists of the country never heard of the American Conference of Pharmaceutical Faculties and therefore do not know its aims and purposes. Nearly all of the large body of young people who enter colleges and schools of pharmacy each fall, select the institutions which they will attend without reference whatever to the things for which we stand. Therefore, we should devise means whereby our existence, our aims and purposes, should become widely known and such knowledge should be kept constantly before those who are likely to be interested or benefited thereby.

The second point is membership. It is highly probable that of the sixty institutions that are not of us there are some that would do us credit. When we will have secured the membership of all the worthy institutions then we will have the power to wield an influence upon those schools that are not with us. Having such a membership we could reasonably ask recognition at the hands of the Boards of Economy.

Our relations with the Boards of Pharmacy is the third point to which attention should be given. These should be close and most cordial, and we can then justly ask and readily obtain a special recognition at their hands. At present one State and one Territory have granted this recognition voluntarily. Other boards have fixed minimum standards for schools whose students shall receive credit from them. We should not neglect the opportunity afforded us in the simultaneous meetings of the National Association of Boards of Pharmacy and this Conference now in session here, of working together in harmony and in a spirit of co-operation.

Finally, the enactment of laws making graduation a prerequisite for registration is the chief factor that will enable us to put into effect a high standard of qualification. A remarkable change in sentiment in this particular is taking place. It seems that in no way can the Conference better serve the purposes of its organization than by throwing all possible energy in this direction.

It was voted that the recommendations in the President's address be taken up as a special order of business. After considerable discussion by many of the delegates present it was voted that an invitation be extended to the National Association of Boards of Pharmacy to meet in joint session with the American Conference of Pharmaceutical Faculties.

The Executive Committee was instructed to prepare a statement explaining what the American Conference of Pharmaceutical Faculties is, its aims and objects, and mail to the members of the Conference for approval the approved draft to be inserted in the catalogues of the institutions which are members of the Conference.

The report of the Treasurer showed expenditures of $110.20 for the year, leaving a cash balance in the treasury of $111.64.

Several amendments to the Constitution and By-laws of minor importance were adopted. A section of the By-laws providing for the withdrawal of members was adopted as well as one providing for the taking of votes by mail.

The School of Pharmacy of the University of Washington, Seattle, Wash.; The School of Pharmacy of the University of Oklahoma, Norman, Okla.; and the Department of Pharmacy of the Alabama Polytechnic Institute, Auburn, Ala., were elected to membership in the Conference.

The report of the Committee on "What Degrees should be conferred by Colleges of Pharmacy?" was read by the chairman of the committee, Professor Caspari, as follows:

(1) That the degree of Graduate in Pharmacy (Ph.C.) be granted or conferred by colleges that comply with the minimum requirements adopted by the American Conference of Pharmaceutical Faculties, at the regular session held in Kansas City, September 8, 1904.

(2) The degree of Pharmaceutical Chemist (Ph.C.) to be conferred by colleges and schools of pharmacy on the following conditions:

(*a*) As entrance requirement two years of completed high-school work or its equivalent and satisfying the other requirements specified in the first recommendation.

(*b*) The college work to consist of at least 750 hours of lecture and recitations and 900 hours of laboratory work.

(3) That the degrees Bachelor in Pharmacy, Master in Pharmacy, and Doctor in Pharmacy be not conferred unless they represent an

amount of work required for similar academic degrees required by reputable colleges and universities.

This report was the subject of prolonged and earnest discussion. No action was taken with reference to the report except that it was laid on the table and the following resolution by Professor Kremers was made a special order of business at the next annual meeting:

Resolved, That it be the sense of the American Conference of Pharmaceutical Faculties that the institutions herein represented should strive to make the Bachelor's, Master's and Doctor's degrees in pharmacy the educational equivalent of similar academic degrees as rapidly as the advancement in pharmaceutical education in this country will permit.

The following officers were elected for the ensuing year:

President—H. M. Whelpley.

Vice-President—C. Lewis Diehl.

Secretary-Treasurer—J. O. Schlotterbeck.

Executive Committee—W. A. Puckner, chairman; Wm. Searby, H. H. Rusby.

A joint meeting of the American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy was held at the Islesworth Hotel, Atlantic City, N. J., September 6, 1905.

Mr. I. A. Keith, of the South Dakota Board of Pharmacy, was elected chairman, and Professor H. M. Whelpley as secretary.

A committee of five, consisting of Prof. O. Oldberg (Illinois), chairman; and Prof. Geo. B. Kauffman (Ohio), Z. B. Hopkins (Vermont), F. B. Lillie (Oklahoma), and I. A. Keith (South Dakota), was appointed to arrange a programme for the annual joint meeting for 1906.

It was voted that the joint meetings be open to all interested parties.

It was also voted that a copy of the minutes of this and of subsequent joint meetings be incorporated as a part of the printed proceedings.

J. O. SCHLOTTERBECK,
Secretary.

NOTES AND NEWS.

THE FAIRCHILD SCHOLARSHIP AND PRIZES for students of pharmacy in Great Britain and Ireland were founded in 1905 by Messrs. Fairchild Bros. and Foster, of New York, in appreciation of the friendly relations which for many years have subsisted between them and the pharmacists of the United Kingdom. This Scholarship is open to any apprentice or assistant of either sex, preparing to qualify under the Pharmacy Act, 1868, or the Pharmacy Act (Ireland), 1875. The primary condition imposed is that the applicants satisfy the requirements for admission to the respective qualifying examination, *i. e.*, the Minor Examination in Great Britain, or the License Examination in Ireland.

It is proposed to award one Scholarship of the value of £50 annually, based upon the results of a competitive examination.

In addition to this Annual Scholarship of £50, Prizes of £5 will be awarded to each of the best candidates entering in England, Ireland, Scotland and Wales.

The successful candidate at the examination to be held the last week in June, 1906, will be at liberty to select any well-known school or college of pharmacy in Great Britain or Ireland, where he proposes to study for the qualifying examination during a period of not less than three months within a year from June 1, 1906.

The money of the Scholarship will be devoted to paying the college fees and expenses, and what is over will be paid to the scholar for maintenance during the school term by the principal of the school on behalf of the founders of the scholarship.

No candidate will be admitted for the examination in 1906 who has not completed twenty years of age, or who exceeds twenty-two, on January 1, 1906. Applications should be addressed to the Secretary, and must in each case be accompanied by certificates of birth and registration as students.

The Committee of Trustees is composed as follows: Messrs. Peter Boa, Phar. Chem., Edinburgh; John W. Bowen, Phar. Chem., London; Albert Hagon, member of the Pharmaceutical Council, Cardiff; William Kirkby, F.L.S., Phar. Chem., Manchester; W. Watson-Will, F.C.S., F.L.S., Phar. Chem., London; W. F. Wells, President, Pharmaceutical Society of Ireland, Dublin; A. E. Holden, Phar. Chem. (of Canada), Bath House, 57–60, Holborn Viaduct, London, E. C., *Secretary to the Committee.*

PROF. SAMUEL P. SADTLER recently gave an illustrated lecture on the "Petroleum Industry," under the auspices of the Students' Chemical Society of Princeton University. The lecture was followed by a reception at the Ivy Club.

THE AMERICAN
JOURNAL OF PHARMACY

FEBRUARY, 1906.

JAPANESE LAC.—(KI-URUSHI).

By A. B. Stevens.

Doubtless nearly every one has seen and admired the beautiful Japanese vases or boxes without realizing that they were finished with the most indestructible varnish known to man. There are at present vases, more than a century old, that have retained their beautiful luster so perfectly that they look as though they had been finished but yesterday. The hardened surface formed by the genuine Japanese Lac is practically unaffected by the usual reagents, which are so detrimental to most varnished surfaces, as alcohol, ether, alkalies and acids. It is acted upon to some extent by strong sulphuric or nitric acid, and may be dissolved by continued heating in fuming nitric acid.

Rein[1] states that the Japanese doubtless received their knowledge of the lac industry from the Chinese in the early part of the third century. But that its use did not attain great importance before the middle of the seventh century. Kôtoku-Tennô, the thirty-sixth Mikado (645 to 654 A.D.), had a ceremonial head-covering of paper, which was covered with black lacquer. There is a lacquered scarf box in the temple at Nara, which belonged to a priest in the time of Kinnari Tennô (540 to 572 A.D).

For centuries its use and production remained a secret. As late as 1873 we find the statement that "The manner of preparing the varnish and the mode of applying it is likely to remain a secret."[2]

[1] J. J. Rein's "The Industries of Japan," London, 1886; Rein, "Japan II," Leipzig, 1886. This author has minutely described the lac industry, and it is to this excellent work that I shall frequently refer.

[2] Belfour's Cyclopædia of India.

In the following year Prof. J. J. Rein made a thorough study of the method of collecting and applying the lac.

The pure lac is a natural product of *Rhus vernicifera*, a small tree about 15 feet high, growing wild in China and Japan, where it is also cultivated in many parts of the country. The largest yield is from trees about fifteen years old, but the age of the tree when the lac is collected varies in different localities, in some places at from five to six years when the stem is the size of a man's arm, and in other localities at from nine to ten years old. The time of collecting is from April to the 1st of November.

The lac is obtained by making horizontal incisions in the bark with a hook-shaped instrument and alternating from side to side of the tree. The sap is removed from the incisions with a pointed spatula. These operations are repeated at intervals of about four days until the tree is literally covered with grooves. The lac is in the form of a grayish-white emulsion, which, on exposure to air, changes to brown and finally to black. The raw lac is strained to remove pieces of bark, and then mixed until uniform, when it is ready for use, and is known as "Ki-Urushi." A second grade known as "Seshime-Urushi" is obtained at the close of the season by cutting and binding the branches into bundles and macerating these with the trunk in warm water, when more of the sap exudes and is removed from the surface of the water.

The beautiful black color is produced by "Laccasse," a soluble oxidizing enzyme, acting on the resins in the presence of moisture. The best results are obtained by allowing the lac to harden in a moist atmosphere. Therefore, the articles coated with the lac are placed in a room and wet clothes hung on the walls or about the lacquered articles. A temperature of from 20° to 30° is best for the action of the enzyme. If the lac is allowed to harden in a dry atmosphere it has a dull appearance, varying in shade from brown to black.

The most important chemical investigations of this lac were made by two Japanese chemists.[1] Yoshida reports that the lac consisted of a non-volatile resinous acid, which he calls urushic acid, a volatile poison, gum, identical with gum arabic, diastatic matter and water.

---

[1] H. Yoshida, *Jour. Chem. Soc.*, 1883, p. 472. O. Korschelt and H. Yoshida, *Transact. As. Soc.*, Japan, XII, p. 182.

I have found that his urushic acid consisted of at least four substances, one of which is the poisonous principle and is non-volatile. Also that the gum and diastatic matter are inseparable. The volatile portion, obtained by passing steam through the lac, consisted of acetic acid and a small quantity of the resinous acid, which was evidently carried over with the steam, but on removal from the distillate by shaking with ether and then evaporating was not volatile or poisonous. The distillate also contained acetic acid.

The resinous substances were removed from the other constituents by dissolving in alcohol and recovering the alcohol by distillation.

Separation by Lead Acetate.—Lead acetate was added to a portion of the alcoholic residue as long as a precipitate was formed. The precipitate, which was of a light-gray color, was washed with alcohol, mixed with fresh alcohol, decomposed with sulphuric acid, and the excess of acid removed with lead carbonate. On evaporating the alcohol a brown oily residue was obtained, which was somewhat darker than the original alcoholic residue, but otherwise similar.

To the filtrate from the lead acetate precipitate, solution of lead subacetate was added as long as a precipitate was formed. The precipitate was of a gray color, but lighter than that obtained by lead acetate. On decomposing the precipitate as above, an oily residue was obtained, which was also lighter than that obtained from lead acetate.

The filtrate from the subacetate precipitate was still of a brownish color. The excess of lead was removed by sulphuric acid, and the excess of acid removed by lead carbonate and filtering. The filtrate was readily precipitated by lead acetate or subacetate. By repeated experiments with the original alcoholic solution it was found that by precipitation with lead acetate and removing the lead and acid from the filtrate, adding more lead acetate, and repeating this operation until all of the resinous substance was precipitated, and finally decomposing the separate precipitates, that a series of oily residues could be obtained, gradually diminishing in quantity and increasing in fluidity, and becoming a shade lighter in color than the preceding. Lead subacetate is a better precipitant than lead acetate. The acetic acid liberated evidently aids in preventing complete precipitation. The fact that the fractions decrease in color and viscosity, and that only the last fractions were poisonous, indicates that the

alcoholic extract consisted of a mixture of two or more substances. But in no case can the above method be considered as a complete separation. Alcoholic solutions of each of the fractions assumed a green or greenish-black color with alkalies, the color varying with the concentration of the solution and the strength of the alkali.

By shaking an ether solution of resinous substances with a 1 per cent. solution of sodium carbonate a solution was obtained which deposited a reddish-brown precipitate on the addition of an acid. This precipitate was insoluble in all ordinary solvents, including acids and alkalies, except fuming nitric acid. This is doubtless the same substance which Yoshida obtained and named "Oxyurushic acid," but as it does not possess any of the properties of an acid Professor Tschirch suggested the name "Oxyurushin," which I have adopted. All of the resinous substances may be converted into oxyurushin by heating with a sufficient quantity of fixed alkali, when it will be precipitated as a black insoluble compound, changing to reddish brown on the addition of acids.

Separation into Benzin-soluble and Benzin-insoluble.—At first it appeared as though the alcoholic residue was soluble in all of the ordinary solvents for oils and resins, but investigation proved that it was not completely soluble in all proportions of carbon disulphide, methyl alcohol, amyl alcohol or petroleum benzin. After numerous experiments the following method was adopted: One part of the resinous substance was dissolved in 7 parts of benzin, forming a clear solution, but further addition of benzin caused a precipitate. This was then poured into 55 parts of benzin, which caused an immediate separation of a thick, brown mass, leaving a cloudy liquid. After twelve hours the benzin became clear and was not affected by the further addition of benzin. The benzin was decanted and the precipitate dissolved in a small quantity of benzin and again precipitated by pouring into a larger amount. This operation was repeated several times until the precipitate became entirely insoluble in benzin. By this method the resinous substances were separated into a benzin-soluble and a benzin-insoluble.

Separation of the Benzin-insoluble into Methyl Alcohol-soluble and Methyl Alcohol-insoluble.—By treating the benzin-insoluble portion with methyl alcohol it could be separated into two substances, one soluble and the other insoluble in methyl alcohol. Only about half of the insoluble portion was soluble in ether, the remainder appar-

ently having undergone oxidation into oxyurushin during manipulation with methyl alcohol and evaporation. This theory is supported by the fact that the methyl alcohol solution becomes cloudy on standing. A similar change doubtless takes place in ethyl alcoholic solutions, though much more slowly, as a slight deposit was noticed when an alcoholic solution was allowed to stand for some time.

Separation of the Benzin-soluble into two or more substances.—The benzin solution was evaporated and 1 volume of the oily residue dissolved in 8 volumes of benzin and 4 volumes of alcohol added and the whole thoroughly agitated. Upon standing it separated into two layers. The upper benzin layer was of a yellowish-brown color, the lower alcohol layer reddish brown. These were separated and the benzin solution washed with alcohol as long as the washings were colored. The benzin was evaporated, leaving an oily, non-poisonous, brown residue. The alcoholic solution was evaporated, leaving a slightly gelatinous residue, and by rapidly washing this with benzin a small quantity of oily residue was separated from the gelatinous mass. Both were poisonous. Further washing with benzin dissolved the gelatinous portion. I believe that the alcoholic portion consists of a poisonous and a non-poisonous substance, but thus far have not been able to make a complete separation. I hope to do this later.

All of the above substances in alcoholic solutions were precipitated by lead acetate, subacetate, silver nitrate, mercurous nitrate, cupric acetate and ferric chloride. The lead precipitates were of a light-gray color, gradually becoming darker on standing. All the other precipitates were black.

The resins insoluble in benzin, on exposure to the air in thin layers, slowly changed to oxyurushin. Numerous combustions were made of these and also of the oxyurushin formed by the action of alkali. The oxidation products seem to be the same in all cases. The mean of the results of combustion is as follows:

Found	Calculated for $C_{102}H_{138}N_2O_{19}$.
72.137	72.206
8.158	8.202
1.652	1.656
18.053	17.936

The Gum-enzyme.—After extracting the lac with alcohol the residue was extracted with cold water and the gum-enzyme precipitated

by pouring into strong alcohol. The precipitate was dissolved in a small quantity of water and reprecipitated with alcohol. By repeating the operation several times and finally washing with ether and drying in an exsiccator, it was obtained perfectly white and easily reduced to powder. In physical appearance it is similar to powdered acacia. When so prepared the gum-enzyme is very active, rapidly changing fresh tincture of guaiac to a deep blue. If an emulsion is made of the gum enzyme and the separated resins, it soon changes to black, but if a solution of the gum-enzyme is heated before mixing with the resins, no change takes place.

Tests for Nitrogen.[1]—The gum-enzyme was tested for nitrogen by the Lassaigne test, which consists in heating the substance with metallic potassium and converting the cyanide so formed into Prussian blue. This test and various modifications of it failed to detect the presence of nitrogen.

When the gum-enzyme is heated in a tube with soda-lime or potassium hydroxide the vapors rapidly change red litmus to blue, but no odor of ammonia could be detected. Professor Tschirch thought the odor similar to pyrrol. By using larger quantities and condensing the vapors, the distillate gave all of the tests for pyrrol.

Another evidence of the presence of nitrogen was obtained as follows: An ordinary open combustion tube was filled with copper oxide and ignited in a current of oxygen. After partially cooling a platinum boat containing the gum-enzyme was introduced, and burned in a current of oxygen. The products of combustion were conducted into a potash bulb containing a solution of potassium hydroxide, prepared from metallic potassium, and water distilled with potassium permanganate. Just before the combustion the solution was tested and found to be free from nitrogen compounds. After the combustion the solution gave with diphenylamine the blue color characteristic of nitrates; with brucine and sulphuric acid a red color and with sulphuric acid and sulphate of iron the brown ring test.

Separation of Gum from the Enzyme.—H. Yoshida states that after removal of the resins by alcohol and extracting the residue with cold water, and then boiling the solution, he obtained a white

---

[1] For a detailed report of nitrogen in gums, see AM. JOUR. PHARM., 77, p. 255, 1905, also *Pharm. Centralhalle*, 1905, p. 501.

precipitate, and assumes that it is the enzyme that has been removed; but such cannot be the case, as a solution of the pure gum, which is very active, does not give any precipitate on boiling. The precipitate may have been some vegetable albumen which was present in the lac, but I have been unable to find it after repeated trials. All attempts to free the gum from nitrogen have been without success.

Oxidation Products of Gum-enzyme.—Mucic acid is the principal product obtained by oxidizing the gum-enzyme with nitric acid 1·150 sp. gr. Oxalic acid and tartaric acids were also formed.

Hydrolysis of Gum-enzyme.—The gum-enzyme was heated for eight hours with 2 per cent. sulphuric acid, and the acid removed with barium hydroxide and carbonate. The solution was evaporated under diminished pressure, when it formed a light yellow syrup, noncrystallizable, nonfermentable, reduced Fehling's solution and was dextrorotary.

One part of the syrup was heated one hour with 2 parts of phenylhydrazine, 3 parts of sodium acetate, and 20 parts of water. On cooling, an abundant yellow crystalline deposit formed. This was several times recrystallized from hot alcohol when the melting point remained constant, beginning at 162° C. and was complete at 164° C. without the liberation of gas. The crystals were in small spheroidal clusters, which under the microscope appeared to consist of aggregations of needles. This corresponds exactly with the description and melting point given for phenylsorbinazone.[1] A second crop of crystals was obtained by concentrating the mother liquor. These were somewhat darker than the first, and had a melting point of 157° C., but with the production of gas. This corresponds with the description given for inactive sorbinazone.

Bertrand,[2] when working with soluble oxiding ferments, used the gum-enzyme from Japanese lac under the name "Laccasse." He reports that it contained 0·44 per cent. of nitrogen, which he determined by heating with soda-lime and estimating the ammonia formed by titrating with decinormal sulphuric acid. From this he calculated the amount of enzyme present by assuming that it has the elementary composition of albumenous substances. He then gives the composition of the gum-enzyme as:

---

[1] Vaubel, Quantitative Bestimmung. Organ. Verbindungen, II Band, 3, 304.

[2] *Bull. Soc. Chem.*, third series, 51, p. 259. 1891.

Water	74·	per cent.
Gum	84·95	"
Laccasse	2·50	"
Ash	5·17	"

From the preceding work it seems to me that I am justified in saying that what he estimated as ammonia was not ammonia but pyrrol.

The Poisonous Principle and its Action.—Prof. J. J. Rein describes the lac poisoning as follows:[1] "It is a peculiar, not very painful, and not at all fatal, but always a disagreeable disease, always attacking any one new to the work. It appears in a mild reddening and swelling of the back of the hands, the eyelids, ears, the navel and lower part of the body, especially the scrotum. In all these parts great heat is felt and violent itching and burning, causing many sleepless nights. In two or three days the crisis is reached, and the swelling immediately subsides. In severe cases small festering boils form also. This lacquer disease is not only caused by handling of the lac, but by its evaporation chiefly, especially that of the sharp Se-shime, to which I owe my own illness. . . . The poison, however, is a volatile substance, and has nothing to do with the lac acid in its higher oxidation, as Korschelt believed. If the poisonous property disappears in the drying of the plant, this amounts to nothing save that the volatile poison fully escapes in this manner. A considerable part of it is driven off in the preparation of the several kinds of lacquer, and by stirring in open vessels. For this reason, the lacquers mixed with colors are regarded far less dangerous than the raw lac and its derivatives. When such lac has been for a long time shut up in a closed box or tub, the experienced workman turns away his face when the vessel is opened that he may not inhale the accumulated vapors."

Yoshida also states that the lac contains a volatile poison which is dissolved with the urushic acid by alcohol, but is almost completely driven off by drying the acid at 105° C. to 110° C. Bertrand[2] says that the lac must be handled with the greatest precaution, because the least traces in the state of vapor produce on the face, hands and arms an intense rubefaction, accompanied by in-

---

[1] "The Industries of Japan," p. 349.

[2] *Annal. de Chem. et de Phys.*, Series XII, 1897.

tense itching, and adds that these malicious properties make the study of the lac very tedious, and he was obliged to interrupt the studies on account of individual sensibilities.

With these statements before me, it was not without misgivings that I undertook the study of the lac, and these were not allayed by my first experience. The first sample received was in a glass can with metal top which had become sealed by the lac, and was difficult to remove, but when finally started was accompanied by a slight sound of escaping gas. In about thirty-six hours an inflamed spot, about 2 centimeters by 5 centimeters, appeared on my wrist; it itched intensely for about a week and then disappeared. Laboring under the supposition that I was dealing with a volatile poison, I was extremely cautious not to come in contact with the vapors in any form, but supposed that I was practically safe after the alcohol had been distilled and the residue heated for some time. While shaking out an ether solution of the alcoholic residue with sodium carbonate solution, it was difficult to keep the hands entirely free from the solution, and no especial pains were taken to remove it except to carefully wash with soap and water. However, after working some time with it, my face began to swell and continued until my eyes were nearly closed. It extended over hands, arms and lower limbs to the knees; the desire to scratch was very great, so that it was almost impossible to sleep. This was also true of the face and ears to some extent, but here the sensation was more that of burning. After about a week the face became normal, and I was able to resume my work, but the limbs continued to itch and remained covered with a fine rash. After several weeks I became convinced that the underwear had absorbed some of the poison, and though frequently washed still retained it; or that they acted as an irritant to the inflamed surfaces. Soft gauze underwear was then worn next the skin, when the flesh soon became normal.

Dr. Jadassohn, Professor of Skin Diseases in the University of Bern, stated that the above symptoms did not prove that the poisonous principle was volatile, and kindly volunteered to make the physiological tests for me in order to determine whether the poisonous principle is volatile or not. He found that the rabbit was very sensitive to the poison. The method of testing was to rub a small quantity of the substance on the inside of the ear for two or three minutes. If poisonous, inflammation appeared in from one to five

days and the surface soon became covered with watery blisters, followed in severe cases by necrosis of the superficial layers of the skin. This condition lasted about fourteen days, when it gradually disappeared.

Sterilized lac prepared by suspending a tube of the lac in boiling water for half an hour was poisonous. An alcoholic solution of the lac was distilled and the distillate tested, but was not poisonous. After the alcohol was removed the distillation continued, when a small quantity of aqueous distillate was obtained, but this was also inactive. The residue in the retort was extremely poisonous. A fresh can of lac was thorougly cooled to prevent the escape of gas while opening, two small openings were made, and tubes introduced. A small quantity of absorbent cotton was placed in the tube used for the exit of vapor to prevent particles of the fluid from being forced through. The vapor was then slowly forced out of the can upon the ear of a rabbit. Part of the ear was previously moistened. The vapor was entirely without action. Since then I have worked over the lac while evaporating it under all conditions without the slightest inconvenience. The alcoholic residue was later separated into two parts; one soluble and the other insoluble in benzin. The first was poisonous and the second non-poisonous. A thin layer of the first was left in an open crystallizing jar for four months, when it was found to be still poisonous. Another sample of 5 grammes was left in an open vial on a laboratory shelf for ten months, including the hot summer months. This was then tested on my arm, and was found to be still active. These facts are sufficient to prove that the poisonous principle is non-volatile. Doubtless the cases of poisoning that have occurred from opening retainers have been due to minute particles of the lac being forced out with the vapor.

The poison is extremely active even in minute quantities, and as it forms a part of the resinous body, it is very difficult to remove from the skin or clothing. Washing with soap and water is not sufficient to insure its removal. If the hands after contact with the lac are thoroughly washed with soap and water until they are to all appearances clean, and then wet with a solution of caustic alkali, black spots will appear wherever the lac has been in contact. A mixture of powdered soap, pumice stone and carbonate of soda gives the best result. However, to insure safety, I have usually followed this with soap and sand. The poison seems to have little or

no effect upon the thick inner skin of the hand, but to prevent its transmission to other parts it should be removed as soon as possible. For example, by accident some of the benzin solution was thrown into one eye and over one hand. The eye was thoroughly washed with benzin and alcohol, but, in my anxiety for the eye, the hand was forgotten for twenty or thirty minutes, when it was thoroughly washed with benzin and alcohol, followed by soap and sand. The eye escaped without further inconvenience than that caused by the benzin, but in thirty-six hours the surface of the hand became slightly swollen, itched considerably for a week, and then appeared to be covered with a thin, dry scale, which finally disappeared. Since then I have tested different parts of the substance to determine whether or not they were all poisonous, by cutting a hole 6 m.m. in diameter in a piece of gum paper, pasting this on the arm and applying the substance to the opening. In from thirty minutes to one hour the paper was removed and the spot washed with ether or benzin. When the substance was poisonous, the spot became red and began to itch within thirty hours. From three to five vesicles usually appeared. The itching was not intense, usually lasting only a few minutes at a time. A dry scale formed over the surface and remained for several weeks after all irritation ceased.

The poison has not at the present time been isolated in a pure condition.

Dr. Jadassohn and his assistants, Drs. Winkler and Schulz, made twenty-six tests with parts of the lac obtained under different conditions.

Only that portion which is completely soluble in benzin is poisonous and this we have previously seen has been separated by shaking out the benzin solution with alcohol, into two parts, one soluble in alcohol and poisonous, the other insoluble in alcohol but soluble in benzin and non-poisonous. I have elsewhere stated that by fractional precipitation with lead acetate a partial separation of the poison was obtained, but that I did not consider it a practical method.

After the above experiments with the poison were made I received from Dr. F. Pfaff a reprint of his article "On the Active Principle of Rhus Toxicodendron and Rhus venenata."[1] As the

---

[1] *The Journal of Experimental Medicine*, Vol. II, No. 2, p. 181, 1897.

poisonous action of these plants is practically identical with that of the Rhus vernicifera, his work is of special interest in this connection. He has conclusively proven that the poisonous principle of poison ivy is non-volatile, thus shattering the false idea that has existed for so many years. He claims to have separated the poisonous principle in a pure form by fractional precipitation with lead acetate as an oil. Dr. Pfaff gives the composition of his lead compound as $C_{21}H_{30}O_4P_7$ and proposes the name "Toxicodendrol" as the name of the poisonous principle. The poisonous principle of Japanese lac is so intimately associated with the resin of the lac that I have not considered the method of fractional precipitation to be a complete separation. Preceding investigation indicates that the poisonous principles of these plants are identical, but further investigation is necessary before this can be accepted as conclusive. I hope during the coming year to separate the poison from both these plants and determine their relation. Also to separate the poison from Japanese lac in a pure condition.

The present researches in Japanese lac were undertaken in the Laboratory of the Pharmaceutical Institute of Bern under the guidance of my most highly esteemed director, Prof. Dr. A. Tschirch. To him and also to Prof. Dr. Oesterle I desire to express my warmest and sincerest thanks for the inspiration and the friendly interest and advice which has ever been so freely and so kindly given.

The lac for this investigation was kindly presented by forester Shirasawa, of Tokyo, Japan, and the Rhus Company, Frankfort, Germany. To them I extend sincere thanks.

ANN ARBOR, MICH.

NASCENT SILVER IODIDE.

BY M. I. WILBERT,
Apothecary at the German Hospital, Philadelphia, Pa.

Something more than a year ago one of the physicians connected with the out-patient department of the German Hospital, Philadelphia, requested the assistant apothecary, Mr. John K. Thum, to compound a prescription composed of 5 grammes of a proprietary silver salt and 1 gramme each of iodine and potassium iodide, with a sufficient quantity of water to make 100 c.c. This mixture was

intended to be used as an injection into the urethra, and the direct object that was sought to be attained was to increase the activity of the silver salt and at the same time to eliminate the very objectionable tendency to stain, that is so evidently inherent to all of the soluble salts of silver. The assistant apothecary duly called the physician's attention to the fact that the resulting mixture would necessarily contain something quite different from what he had probably intended, and that in place of using an organic combination of silver he would really be using a nascent or freshly prepared silver iodide that could be produced much more economically by means of silver nitrate in place of the inordinately expensive organic salt of silver. To demonstrate the accuracy of this statement, a corresponding mixture was made by using silver nitrate as the source of the silver iodide.

This nascent silver iodide mixture, prepared from silver nitrate, was subsequently used in a number of cases, and was found to be in all respects the equal, and in some particulars very much superior, to the mixture prepared from the proprietary silver salt. The resulting preparation, made in the form of an emulsion, has been used quite freely, not alone at the German Hospital but also in other institutions, and a preliminary note on "The Use of Iodide of Silver in Urethritis," by Drs. Siter and Uhle, was published in the University of Pennsylvania *Medical Bulletin* for May, 1905.

It may be added here that the use of silver iodide for other purposes than that of a local antiseptic in urethritis, is not by any means of recent origin. Silver iodide was made official in the U.S.P. for 1880, and, for a period at least, was extensively used for internal administration, under the false supposition that, being itself insoluble, it would not produce argyria.

The popularity of silver iodide as an internal remedy was evanescent, however, and the preparation itself was omitted from the recent eighth decennial revision of the Pharmacopœia.

From its widespread use in photography, it has been known for a long time that silver iodide exists in several allotropic forms, and, further, that these allotropic forms or varying physical conditions of the substance play a very important part in its chemical activity when brought in contact with other materials. It has also been known for a long time that although silver iodide is insoluble in water, it is readily decomposed by reducing agents into its constitu-

ent elements, which are known to be active and highly efficient antiseptics.

Bearing in mind, then, these several well-known facts relating to silver iodide, the rationale of the use of this salt for local application as an antiseptic is quite evident. Being itself insoluble, it is not caustic or irritating, while the fact that it is readily decomposed in the presence of reducing agents into active antiseptic materials, would readily suggest its use for this purpose as being practically ideal.

That the activity of the silver iodide varies with age, the exposure to which it has been subjected, and also, in a measure at least, to the relative fineness of the precipitate, are facts also well known to photographers, and may readily be demonstrated by using as a test reagent either a solution of one of the well-known reducing agents used for developing photographic negatives, or a specimen of alkaline urine.

With a finely divided precipitate that has not been unduly exposed, the reduction takes place very rapidly, while an old, or a comparatively coarse, silver iodide may require several minutes before distinct evidences of decomposition manifest themselves. This reduction test, it may be added, should and does offer a readily available method for determining the activity, and therefore the desirability of any given sample of silver iodide.

The most available form for using nascent silver iodide is that of a mixture or an emulsion, being practically a simple suspension of the freshly precipitated silver iodide in a viscid liquid. This vehicle, or suspending medium, may be varied to suit individual need or preference, any one of the bland, inactive, mucilaginous substances, such as Irish moss, quince seed, salep or tragacanth, being readily available.

A mixture containing approximately 3 per cent. of silver iodide has been found to be generally most satisfactory. In preparing such a mixture it should always be borne in mind that the resulting silver iodide is nearly 40 per cent. heavier than silver nitrate, and that therefore a corresponding smaller quantity of the latter salt should be used.

To be most efficient the mixture should be freshly prepared, and should be kept in a cool, dark place. As noted before, the degree of fineness of the resulting precipitate also plays a very important

part in the probable activity of the completed mixture, so that by varying the nature of the resulting precipitate the activity of the mixture itself may be regulated, within a rather wide range, without varying the amount of the contained active ingredient.

The following formula for a mixture containing approximately 3 per cent. of silver iodide has been in use at the German Hospital for some time, and may be considered as a type-formula that may readily be varied to suit the needs or the whim of the prescriber or the ability and the resources of the dispenser.

℞	Silver nitrate	2·2 gm.
	Potassium iodide	2·2 "
	Distilled water	50 c.c.
	Mucilage of Irish moss, N. F., to make	100 "

To be mixed according to directions.

For a heavy, coarse precipitate the potassium iodide and the silver nitrate are dissolved separately, each in 5 c.c. of distilled water. The two solutions are subsequently mixed and the mixture, after being thoroughly well shaken, is diluted with the requisite amount of distilled water and mucilage to make 100 c.c.

For a light flocculent precipitate the soluble salts are separately dissolved, each in 50 c.c. of distilled water. The solutions are then mixed, and, after being thoroughly well shaken, the resulting mixture is allowed to stand for a sufficient length of time for the precipitate to subside, so as to allow of decanting 50 c.c. of the supernatant liquid, which is replaced by the required mucilage. It will be noted that no provisions are made for washing the precipitates. In mixtures up to and including the equivalent of 5 per cent. of silver iodide it has been found that the accompanying potassium iodide and potassium nitrate do no material harm and are, if anything, an advantage in that they facilitate osmosis. When mixtures of a higher percentage content of silver iodide are to be used, the accompanying soluble salts may prove to be in excess and should be removed by decantation, preferably in a dark room.

The peculiar properties of silver iodide, to disintegrate when brought in contact with reducing agents, would appear to suggest its use for a number of other purposes, either in mixtures or as a dry powder.

Where silver iodide is to be used locally as a dusting powder, the precipitate should be washed with distilled water, to free it from the

contaminating potassium iodide and potassium nitrate, and then carefully dried in a dark place.

In conclusion, it may be pointed out that silver iodide appears to offer a very wide field for experimentation both for the pharmacist as well as for the physician. The varied activity due to age and physical condition, and the readiness with which a fresh and comparatively active preparation may be prepared extemporaneously would appear to offer little or no excuse for the pharmacist not preparing the preparation himself and explaining its virtues to the physician or the surgeon.

For the latter, on the other hand, silver iodide would appear to offer possibilities for application and use as well as opportunities for research and observation that appear to be well nigh inexhaustible.

LONDON BOTANIC GARDENS.

By Pierre Élie Félix Perrédès, B.Sc., F.L.S.,
Pharmaceutical Chemist.
A Contribution from the Wellcome Research Laboratories, London.

(*Continued from p. 9.*)

THE MUSEUMS, LABORATORY, AND HERBARIUM.

Although a detailed description of the above does not fall within the limits of this paper, no account of Kew would be complete without some reference to these essential adjuncts of the gardens, and a rapid enumeration of the salient facts connected with them will accordingly be given.

The idea of forming a museum for the reception of drugs and other economic products derived from the vegetable kingdom, originated with Sir William Hooker, who, in 1847, adapted a brick structure which had previously formed part of the Royal Kitchen Gardens, and converted it into a museum. This, together with a small west wing added in 1881, constitutes the present Museum II (see Plate X); it is now devoted to vegetable products derived from monocotyledons and cryptogams.

Museum I (see Plates VIII and X) was opened to the public in 1857. It contains the dicotyledonous and gymnospermous collections, which were removed to it in that year. The extension on the north side was added in 1881 from a grant made by the India office.

Museum III (see Plates V and X) is devoted to Timbers. The building was erected in 1761 as an orangery for the Princess Augusta. It was subsequently used as an Australian House, until opened as a Timber Museum in 1863. The collections originated with the exhibits of Colonial timbers from the London International Exhibition of 1862, and were greatly increased, in 1878, by the gift to Kew of a rich collection of timber products from the Indian Government, and of a still more extensive one from the India Office in 1880. The specimens in Museums No. I and No. II are arranged according to natural orders (Bentham & Hooker), and maps are placed in the cases containing them, indicating their geographical sources. In the Timber Museum the collections are arranged geographically. The total number of economic specimens exhibited, other than woods, is about 20,000. The wood specimens (including the timber collections in Museum III, and the smaller wood specimens in the other two museums) number 6,500. A large proportion of these specimens are drugs, but the actual figures are not available.

In 1880, the "North" gallery was completed. This building, presented to the nation by Miss Marianne North, and containing an extensive collection of paintings of tropical and sub-tropical plants executed by her, was opened to the public in July, 1882.

The Laboratory (see Plate X), founded by the late J. T. Phillips Jodrell, and hence known as the Jodrell Laboratory, was commenced in 1875 and completed in 1876. It is used primarily for research purposes, and the following workers, among others, have conducted investigations in it: Burdon-Sanderson, Romanes, Church, Lauder-Brunton, Hugo Müller (chemical constituents of the leaves of *Sabal umbraculifera*), Rev. R. Abbay, F. Darwin, Marshall Ward, Pfitzer, Bower, Cross & Bevan (on cellulose), W. Gardiner, E. Schunck (on chlorophyll), Lord Avebury, G. Massee (on fungal plant diseases), De Wevre (on cubebs, etc.), J. R. Green (on diastase; and other researches), and D. H. Scott (the present Honorary Keeper).

The Herbarium and Library (see Plates X and XV).—It will be remembered that towards the close of Sir Joseph Banks' life, a house, called Hunter House—from the name of its owner, Robert Hunter, a successful man of business who had settled at Kew—was purchased by George III, and added to the Royal property. At the instance of Sir Joseph Banks it was determined to devote this to the accommodation of a botanical library and herbarium, and one

of the rooms was fitted up with book-shelves as a commencement towards carrying out this project. At Sir Joseph Banks' death, however, the plan was abandoned, and the house remained empty until the reign of William IV, who granted it to the Duchess of Cumberland for life. The Duke of Cumberland, who subsequently succeeded to the throne of Hanover, resided in it occasionally, and it accordingly became known as Hanover House. After his death, Hanover House remained unoccupied. When Sir William Hooker took charge of the Gardens at Kew, they were unprovided with any public herbarium or scientific library, the collections that had previously existed there having been dismembered before his appointment, as has already been noted. Sir William Hooker, however, possessed an extensive herbarium and library of his own, which he placed at the disposal of the public, the Government renting a neighboring house, afterwards known as "West Park," for their accommodation, and as a residence for the director. In 1852, though still remaining his private property, the director's herbarium and part of his library were removed to Hanover House. After his death in 1865, his herbarium and library were purchased by the Government at a valuation and added to the public herbarium at Kew, which had been founded in 1854, when Bentham presented his extensive private collection of plants and botanical library to the nation.

The older portion constituting the herbarium building proper was erected in 1877 to take the place of the northern portion of "Hanover House," the oldest portion of all, fronting Kew Green, being now devoted to the library. The west wing, erected on the site of the former students' garden, was completed in 1903.

Since the time of Sir W. J. Hooker's appointment to the directorate, the herbarium has received almost all the collections made by Government expeditions, and it has also been the chief recipient in this country of contributions from British and foreign travellers, as well as from Continental museums, so that its collections now consist of upwards of two million specimens. The expansion of the library has kept pace with that of the herbarium, and it now consists of nearly 20,000 volumes. Of these, twelve hundred are kept in a separate building for the use of the gardeners, and the keeper of the museums has about 700 works of reference in his office.

THE ADMINISTRATION OF KEW AND ITS WORK.

The government of Kew is, so to speak, a dual function. In all administrative matters the Director is subordinate to the Board of Agriculture. The direction and organization of the scientific work of the establishment, on the other hand, devolve upon the Director, whose powers in this direction are absolute. Previous to the deliberations of the Royal Commission on Scientific Instruction and the Advancement of Science, generally known as the "Devonshire Commission" (1871–1875), the functions of the Director had not been clearly defined, but in July, 1872, the relations of the Director of Kew to the First Commissioner of Works and Public Buildings were defined as above by a Treasury minute. The Government department has since then undergone reorganization, but its relations to Kew have not been materially altered. It has already been stated that when Kew was converted into a public institution it was placed under the department of Woods and Forests. This Government department was instituted in 1810, and until 1831 its constituents were known as "Commissioners of Woods, Forests, and Land Revenues"; they were replaced by the "Commissioners of Woods, Forests, Land Revenues, Works and Buildings" from 1832 to 1850, and subsequently the department was divided into the "First Commissioner of Works and Public Buildings" and the "Commissioners of Woods, Forests, and Land Revenues," Kew falling under the former. The Board of Agriculture was established by the act of 1899, and, by an Order on Council of March 28, 1903, Kew was transferred to it from the department of the First Commissioner of Works and Public Buildings.

The Director's staff of officers is constituted as follows:

(*a*) Assistant Director. This post has been irregularly occupied, and is at present unfilled.

(*b*) The Curator of the Gardens, who has charge of the living collections. There are two assistant curators.

(*c*) The Keeper of the Herbarium and Library (eight assistants).

(*d*) The Keeper of the Museums (one assistant).

(*e*) The Honorary Keeper of the Jodrell Laboratory, who is, in a sense, its director, the workers in this laboratory not being, as a rule, on the regular staff at Kew. Permission from the Director of Kew is, however, an essential prerequisite for admission.

The heads of the departments (*b*), (*c*), and (*d*) are directly responsible to the Director for the work done under their care. The organization of the scientific work of Kew is hence of the simplest kind, and resolves itself into departmental government, the departmental chiefs being, in turn, severally and individually dependent upon the Director for their instructions.

In considering the nature of the work done at Kew it will be necessary to adopt a method of rigid selection. A short account will, therefore, be given, in the first place, of the special training provided at Kew for young gardeners, after which the relation with the Colonies will be touched upon, especially with reference to economic plants. Finally, the Kew publications and the facilities enjoyed by scientific workers and others, together with the concomitant results, will be briefly surveyed, in so far as they relate to medicinal plants.

The training of gardeners constitutes the only direct educational work carried on at Kew, but it is of far-reaching importance. Five years previous experience is required of every candidate for admission. The training consists of practical work and lectures. In the former, the student is taken successively through the various sections of the gardens and houses; the lectures are delivered concurrently by the officers or their assistants. The lectures comprise a course in physics and chemistry, as applied to botany and geology; another in general botany; a third on economic plants and their products; and a fourth on geographical botany. During his stay at Kew, the young gardener has to collect, mount, and name a herbarium of 250 specimens himself; at the end of two years he is granted a Kew certificate, provided that his work has been satisfactory. The great importance of this training lies in the fact that Kew is thereby enabled to act as a feeder for the staffs of Colonial and home gardens and other botanical institutions.

The relation of Kew to the Colonies is somewhat peculiar, inasmuch as the botanical establishments of these are in touch with the Colonial office, and do not fall within the jurisdiction of the Board of Agriculture as Kew does. The connection between the two is consequently not very apparent at first sight, but Kew is nevertheless the hub of botanical enterprise in India and the Colonies. The whole key to the situation is simply this, that the Colonial office depends chiefly upon Kew for its scientific advice where

Colonial establishments are concerned, while Kew, on its own initiative, provides the latter with the necessary plants or seeds for the development of new industries, acting thereby as a connecting link between them. The staffs of the Colonial establishments, moreover, are recruited, in the main, from men trained at Kew, so that, although Kew has no official control over these institutions, the bond of union is nevertheless a very intimate one. The functions of Kew in this connection have been so lucidly summarized by M. A. Milhe Poutingon, in a report presented to the French Government, that I cannot do better than reproduce them here:

(1) Kew brings together new species and varieties of economic plants, and selects those from among them that are best adapted for propagation in the Colonies. It is hence an intermediate house and a centre of supplies for Colonial establishments.

(2) Kew supplies, or is instrumental in procuring, botanists and gardeners for the official botanical institutions of the respective Colonies, and also for private ventures. It is therefore a training and recruiting centre in this connection.

(3) Kew advises and supplies information to the Colonies on all matters of botanical and horticultural interest. It is hence a central bureau of information for the Colonies.

(4) Kew, finally, by the example o its own organization, helps to mould that of the Colonial centres, thereby ensuring a continuity of purpose and unity of plan which would not otherwise be attainable. Kew, in a word, may be looked upon as the botanical headquarters of the whole Empire from the cultural point of view.

The Colonial botanical establishments referred to above are of three grades, viz.:

(1) Gardens moulded on the pattern of Kew and administered by a scientific director (*e. g.*, Ceylon, Calcutta, Madras, Mauritius, etc.).

(2) Smaller gardens administered by a skilled superintendent. There are many of these in India, and others in Hong Kong, Demerara (British Guiana), etc.

(3) Up till 1886 these two types were the only ones represented. To these a third type was added in that year, on the recommendation of Kew. This type, known as a botanic station, is organized on a smaller scale than either of the two preceding ones, being under the charge of a trained gardener; it is essentially an experiment station, from which the colonists are able to procure suitable eco-

nomic plants and the necessary information for their successful cultivation on a commercial scale. The botanic stations were first established in the West Indies, and subsequently in the West African possessions. In 1898 the botanic establishments of the West Indian Islands (Barbadoes, Leeward and Windward Islands) were placed under a special department of agriculture in charge of Sir Daniel Morris, K.C.M.G., as commissioner.

In illustration of the role played by Kew in the introduction of economic plants into the Colonies, cinchona and coffee may be taken as examples.

The introduction of cinchona into India, as is well known, was due primarily to the efforts of Clements R. Markham and his associates, who were deputed by the Government to collect young cinchona plants and seeds in the Andes. These were forwarded to Kew, and "upon the Royal Gardens devolved the duties of receiving and transmitting the seeds and plants to India, of raising a large crop of seedlings, of nursing the young stock, . . . and of recommending competent gardeners to take charge of the living plants from their native forests to the hill country of India, and to have the care of the new plantations there. Further, with the sanction of the Indian and Colonial Governments, it was arranged that our West Indian Colonies and Ceylon should be supplied with a portion of the seeds" (Abstract from Sir William Hooker's report to Parliament for 1861). The result is too well known to require further comment.

The work undertaken by Kew in connection with coffee covered a still wider range. In 1862 a coffee disease made its appearance in Ceylon. The Government instituted an inquiry, and a botanist from Kew (Marshall Ward) was dispatched to Ceylon to investigate the disease. His reports having shown that it was impossible to combat the disease, Kew undertook to introduce a variety of coffee from West Africa, known as Liberian coffee, which was of a more resistant nature, and from 1874 to 1876 large consignments of seeds and of seedlings raised at Kew[1] were forwarded in Wardian cases to Ceylon, India, Singapore and the Seychelles. Investigations were concurrently instituted on the habits of the plants in their original habitat, and the results were published in an official report.

[1] These operations are carried on in forcing-houses situated at the back of the Curator's office. (See Plate X.) They are not open to the public.

These two examples may be taken as fairly typical of the rest, which are recorded in the reports of the Director to Parliament, and, subsequently, from 1887 to 1899, in the "Kew Bulletin."

Among the many drug-yielding plants and their products which have formed the subject of investigation at Kew, the following may be mentioned: Eucalyptus, ipecacuanha, the plant yielding euphorbium of commerce, tea, cocoa; opium, tobacco, india-rubber, *Ferula Sumbul*, balsam of copaiba, balsam of Peru, cardamoms, castor oil, chicle gum, arrowroot, *Strychnos Ignatii*, sugar-cane, dragon's blood, frankincense, aloes, cuprea bark, cola, star anise, jalap, vanilla, ginseng, cocoanut oil, derris, Paraguay jaborandi, myrrh, gum benjamin, coca, *Antiaris toxicaria* and strophanthus. A bibliography, by Mr. B. D. Jackson, of the scientific work published in connection with Kew from 1844 to 1895, is to be found in the "Kew Bulletin" for January, 1897, and a supplement thereto in the July number of the same year; to this the reader interested in the subject is referred for details. A passing reference, however, must be made to two works indispensable to every working botanist, whatever his sphere of activity may be, viz., the "*Genera Plantarum*" and the "*Index Kewensis*," in the preparation of which the labors of the ex-Director, Sir J. D. Hooker, have played an important part. The most important publication in the eyes of the pharmacist is, however, the "Kew Bulletin," published under the ægis of the former Assistant Director, Sir Daniel Morris, and edited by the Director. Since 1899 the publication of the "Bulletin" has ceased, although appendices, consisting of lists of staffs, botanic establishments, new garden plants, and seeds for exchange, are still issued. All matters of economic interest dealt with at Kew during the period of 1887 to 1899 are recorded in the "Kew Bulletin," which was "a continuous record of Kew work in all its various aspects" during that period.

Every facility is offered to the research student, whether it be in the gardens, laboratory, or museums, but no provision, beyond that offered to the general public, is made for the elementary student, this function being now relegated to the Chelsea Physic Garden and to the Royal Botanic Society's Gardens in Regent's Park. Among the many authors of eminence whose works are largely based on the facilities provided at Kew, the following may be mentioned: Daniel Hanbury, who frequently visited Kew in connection with the "Pharmacographia," of which he was joint author; Triana, who

consulted the collections at Kew for the preparation of his work on Cinchonas; J. E. Howard, the author of classic monographs on the genus *Cinchona;* Bentley and Trimen, whose well-known work on medicinal plants contains numerous plates of plants figured from the Royal Gardens; Sir George Watt, the author of the "Dictionary of the Economic Products of India," who is at the present time working at Kew; and last, but not least, Mr. E. M. Holmes, the veteran pharmacognosist, one of the most indefatigable investigators of the riches of Kew.

Kew, finally, is under constant requisition by manufacturers, druggists, and drug-brokers, on questions of economic botany which affect their respective callings.

[There is no connected account of Kew at present available, most of the literature on the subject consisting of scattered collections of facts from which it is extremely difficult to construct a coherent record. To the student who is desirous of pursuing the subject further, the following list may be of use, as it includes the most important works on the subject:

Historical account of Kew to 1841, by the Director, in the "Kew Bulletin" for December, 1891. Contains copious citations from the earlier literature.

The annual reports of the Director of Kew Gardens to Parliament from 1850 to 1882. Index to reports (1862–82) on page 3 of "K. B." for 1890. Irregular reports of varying nature (in Parliamentary Blue Books) from 1844 to 1850.

"Kew Bulletin" from 1887 to 1899.

Popular Guide to the Royal Botanic Gardens of Kew—1st to 21st editions, by the Director of Kew (1847–1862); 22d to 30th (the last published) editions, by Prof. Daniel Oliver (1863–1885). This excellent little work has long been out of print, and copies of it are scarce.

John Smith: Records of the Royal Botanic Gardens, Kew, 1880. An account of the old "Botanic Gardens" during the official connection, as curator, of the author, between the years 1822 and 1864. Controversial and scarce.

Report to the Lords Commissioners of His Majesty's Treasury of the Departmental Committee on Botanical Work and Collections at the British Museum and at Kew, 1901. Contains a summary of previous enquiries, a bibliography, and an elaborate memorandum by the Director of Kew. Parl. Return. Commons, No. 205.

The various hand-lists of the living collections, published at Kew, also contain interesting summaries of the way in which the respective collections originated, but most of the information under this head will be found in greater detail in the "Kew Bulletin." A complete list of the hand-lists will be found in the Parliamentary Report previously cited.]

[*To be continued.*]

THE U. S. PHARMACOPŒIA FROM THE POINT OF VIEW OF THE ANALYST AND AS A LEGAL STANDARD.

By Henry Leffmann, Philadelphia.

After a prolonged and wearying delay, the eighth decennial revision of the U. S. Pharmacopœia has appeared. It is an octavo volume of about 700 pages, including indexes and introductory matter. It is not apparent to the outsider why such a work required five years for its preparation. There may be safety in a multitude of counselors; there is apparently not celerity. The relation of the Pharmacopœia to chemistry has been growing closer with each revision. The thin duodecimo volumes that appeared in the first half of the nineteenth century, wisely avoided the battlegrounds of chemical notation and nomenclature. Formulas were ignored; distinctions between such bodies as mercurous and mercuric chlorids were obtained by the simpler and safer means of titles suggesting properties. The growing tendency to make the Pharmacopœia a reference work in chemistry cannot be regarded with indifference or approval. The need of the present day is concise, accurate, reference works. By the elimination of irrelevant matter the book might have been reduced one-third. By a corresponding reduction of price, an increased circulation might have been obtained.

The Pharmacopœia is in some respects an anomalous work. It is primarily intended for the guidance of physicians, yet comparatively few see it and still fewer study it carefully. It devotes much attention to analytic methods, yet it is but little used by those in general analytic practice. Its date is always a misnomer: the present issue is commonly called the Pharmacopœia of 1900, but went into effect on September 1, 1905!

To those who have some knowledge of the history of chemistry and pharmacy, the book has a sentimental interest apart from any critical interest or usefulness. Its monkish Latin preserves the memory of a time when that language was the established channel for the distribution of scientific data; in fact, the first issue (1820) was bilingual, the formulary being in Latin and English on facing pages. Nothing of this remains but the titles, but even these give a medieval flavor, and suggest faintly the Dryasdusts. Enough also remains of the older chemistry to recall the period of the first issue, when the imperfect nomenclature that resulted from faulty trans-

literation of the French system, had introduced the unnecessary genitive construction into many common names. In the current edition these ancient forms contrast strongly with some ultra-scientific and even fantastic structural formulas.

By contrasting the first and current issues, it is easy to note the translation of the control of it from medical to pharmaceutic authorities. The first edition was prepared wholly within the medical profession. Pharmacists were not mentioned in the call for organization and every delegate had the degree of M.D. The Pharmacopœia of 1900 is distinctly a pharmaceutic production. The authority for its publication rests with the "Committee of Revision," composed of twenty-five persons. Eleven are given in the list with the degree of M.D., but of these, four represented pharmaceutical organizations in the convention, and at least two others are not in medical practice.

These points are, however, largely sentimental and it is necessary to proceed to the subject-matter of the paper. An analytical manual should be comprehensive and precise, with as much conciseness as is consistent with clearness. All the obligations of professional life are burdensome at the present day. The practical analyst who desires to give his clients the best service and to hold them to his interest, must be a member of several societies, a subscriber to several journals, and must be continually adding to his library. He ought to be spared unnecessary expense in these lines. The same is true of the druggist. The Pharmacopœia is a work that every druggist should possess. An effort should be made to keep its cost within low limits.

As an analytical manual the Pharmacopœia is much too elaborate in some ways and insufficient in others. It is not a manual of drug analysis, for it includes only those drugs that are, or are supposed to be, in use by physicians. It is further limited by the fact that only one school of physicians is consulted. Remedies used largely by many physicians not of the regular school are wholly excluded. It carries the analysis of some articles to a degree of elaboration beyond the requirements of practical work.

The literary style is objectionable in some ways. While there may be no serious criticism on the general literary form, there is quite too much turgidity and prolixity of expression. The formal and elaborate phrases in the specific definitions may be pardoned.

They are not only interesting relics of past methods, but they are perhaps advisable as aids to memory. The analytic notes and comments should have been given in concise and simple language; "iteration" should have been avoided. In any scientific work, effort should be made to avoid multiplication of terms. The terminology of science grows fast enough from unavoidable causes. He that introduces two terms where one would serve let him be anathema. The framers of the Pharmacopœia have violated this rule in several ways. For years, chemists have found such expressions as "normal silver nitrate," "decinormal potassium hydroxid," or their obvious abbreviations: N; N/10, sufficient for descriptive purposes, yet the Pharmacopœia must introduce the cumbersome "tenth-normal silver nitrate, V. S.," a tautology, at the least, for tenth-normal can be nothing else but a volumetric solution.

The work has been encumbered with a list of "test-solutions"—distinguished by the abbreviation "T. S." Many of these are the ordinary reagents of the laboratory the exact strength of which is of minor moment, and the preparation of which does not need description for either pharmacists or analysts. The preparation of starch solution is given in awkward form; it is much more convenient to stir the starch in cold water and add this to the boiling water, than to reverse the process. Moreover, attention is not called to the fact that starch solution can be preserved for a considerable time, as Moerk has shown, by the use of a little oil of cassia. All the descriptions of the preparation of test and volumetric solutions are prolix and on the style of an elementary manual. The Pharmacopœia is a book for persons more or less experienced; this elementary instruction is redundant, adding to the bulk and, therefore, to the cost.

A serious, inherent, defect of the book from the analyst's point of view is the infrequency of publication and the complicated system by which any revision must be brought about. It has long been evident to many that the ten-year interval is too long for even the needs of general medicine or pharmacy, but it is absurdly long for a book that relates to practical analysis. This department of science goes on by leaps and bounds. A manual that applies to it should be under the supervision of very few persons and should be issued in limited editions that will permit of frequent revisions. Two years, or at most three years, is the efficient life of an analytical manual.

The last convention provided for supplements to the Pharmacopœia, but this will only afford slight relief. It will be five years until a thorough revision can be undertaken and it may be a dozen years before the revision appears, for the revision of 1890 appeared in 1893, that of 1900 in 1905, and at this rate the issue of 1910 will be due in 1917.

Among the special features that are deserving of strong disapproval are the introduction of structural formulas and the use of the hydrogen system of atomic weights.

What possible advantage can accrue to any user of the book from the introduction of such an expression as $CO.(OLi)_2$? Many trained analysts will be obliged to look twice before recognizing lithium carbonate under this hodge-podge. The force of pedantry run mad could hardly go beyond $2(C_2H_2(OH)_2(COOK)\ COOSbO) + H_2O$ or $CH_2O_2 . C_6H_3 . CH:CH . CH:CH . CON . C_5H_{10}$. The first is tartar emetic. If any one recognizes it, this is probably on account of the symbol Sb and not for any understanding of the formula. The second formula is piperin.

It would be interesting to know under whose mismanagement these abstruse and useless formulas were introduced.

By the adoption of the hydrogen standard for atomic weights, all quantitative measurements are put out of accord with those in the preparation of standard solutions as given in the official bulletin of the U. S. Department of Agriculture and of the numerous dependent experiment stations and many analytical manuals.

A commendable reform has been made in the use of "hydrochloride" instead of "hydrochlorate" for alkaloidal salts. Similarly, the restoration of the proper spelling of naphthol and naphthalene is to be commended. It would have been well if the spirit of reform in spelling had stirred the committee more deeply and secured the elision of the useless final "e" in halogen salts and names of alkaloids, but we must be thankful for small favors.

It is to be regretted that the spirit of classicism was so strong that words such as "methyl" and "kaolin" were not made indeclinable. The Latin terminology of pharmacy, slight as it now is, is burdensome, and there is good precedent for simplifying along this line. The whole genitive construction of binary compounds might have been sent by the board. This has, in fact, been done in many English names; why should it not have been done in the

Latin? A few pedants might have protested, but the Latin of the Pharmacopœia has no necessary allegiance to the language of Horace and Quintilian. To the great mass of pharmacists and physicians Latin is not merely a dead language, it is a decomposed one. "Sodium chloridum" would serve as well as "sodii chloridum."

The change from "liquor potassæ" to "liquor potassii hydroxidi" represents no gain in applied pharmacy; moreover, the revisors are not consistent; "liquor calcis" is unchanged. There should be at least a method in the madness of the changes. In the change from *acidum arsenosum* to *arseni trioxidum* a step has been made from one bad form to another. To call the common white arsenic the trioxid when it is a sesquioxid is to add confusion to chemical nomenclature. The older name was objectionable, but the new one is as much so. If *ferri hydroxidum* is acceptable, why should not *arseni sesquioxidum* be equally so? Even *arseni oxidum* would have been better than the given name. Such a non-committal form is adopted in the case of the iodid, which is arsenous iodid and is called simply *arseni iodidum*.

The introduction of many articles belonging essentially to the category of crude drugs adds unnecessarily to the size and cost of the book. The items of the Pharmacopœia should be limited to substances used as medicines, which will, of course, include external as well as internal remedies. Materials which are merely used for extraction purposes, for tests or for the preparation of other remedies by mere dilution, need not be enumerated. Among the substances which would be excluded under this rule are: acetone, acetic acid (glacial and 36 per cent.), strong hydrochloric, nitric and sulphuric, nitrohydrochloric, nitric and sulphuric, nitrohydrochloric and phosphoric acids, oleic acid, absolute alcohol, stronger ammonia, water, bromin, ferric oxid with magnesia, gun-cotton, sublimed sulphur, crude and purified petroleum benzin, paraffin, liquefied phenol, lead nitrate, lead iodid.

It may be said that the control of the purity of preparations must be attained through control of the purity of the original materials, but the methods of the pharmacist can never go to the first condition. He will always rely on the manufacturer at some point, and the purity of a preparation can be as well controlled in the preparation itself as in the crude source. Under "diluted sulphuric acid" it is stated that it should "respond to the reactions and tests for

(strong) sulphuric acid." The tests, however, can be applied as well to the dilute as to the strong acid; indeed, most of them are applied to the latter by considerable dilution, and the pharmacists can control the dilute product perfectly. At the present day any pharmacist can obtain at moderate cost pure strong acids; minute tests, such as those for nitrous compounds in sulphuric acid, are unnecessary.

Much attention has been devoted to the tests for purity of the preparations. This has always been a difficult point in the Pharmacopœia. In some former editions serious errors have been made and injustice has been done. It is too soon to determine how far the new edition has accomplished better work. The Pharmacopœia is always issued under a sort of star-chamber control. Only a few persons are taken into confidence, and the bulk of the medical and pharmaceutical profession finds material for much surprise and astonishment when the book appears.

On some points, however, issue may be taken at once; they are so obviously amiss. I instance first the tests for the purity of water.

The work specifies "water" and "distilled water." The former is defined to be "potable water in its purest attainable state." As we are not informed upon what basis the limitations as to purity are fixed, this definition is vague and ambiguous. We turn, therefore, to the analytic notes. To any one familiar with water analysis, the rubric seems to be more a product of the library than of the laboratory.

In the first place, the sample must be a colorless, limpid liquid, without odor or taste at ordinary temperatures and odorless when heated. Very few potable waters will conform to these requirements, and many that will not are entirely safe for pharmaceutic uses. One gains an idea from this statement that the intention is to include under the title only natural waters of exceptionally high purity, but a few lines below the limit of total solids is given as 500 parts per million. This is equivalent to 29 grains per gallon, an amount unusual in natural waters, except from deep sources. Yet even with this limit the water must be neutral to litmus paper, a condition to which high-class natural waters will not conform, and yet for the rejection of which no good reason seems to be offered.

The total solids of the water are to be determined by a method that is not in use by analysts and is tedious and inconvenient,

namely, the evaporation of 1,000 c.c. on the water-bath. If a determination of total solids is to be made it should be done in a platinum basin and 100 c.c. evaporated. No proper test of this kind can be made without a good balance, and there is nothing but disadvantage in evaporating 1,000 c.c., especially when the question is merely a rough ascertainment for control. The text further states that the residue must not blacken nor emit ammoniacal or acid fumes. Very few natural waters will fail to give upon evaporation of 1,000 c.c. a residue that does not blacken.

It appears, however, that while a high limit is fixed for the solids, the sample is scarcely allowed to contain anything that is usually present in natural waters. Some limits are fixed at almost vanishing points. Thus, for nitrates the delicate and inconvenient diphenylamin test is given. This will probably exclude most natural waters, even the high-class spring and river waters of this region. The limits for sulphates and chlorides seem to be chosen with more regard to uniformity in the reading matter than in the standards. In each case 200 c.c. of the sample is to be taken and 0·5 c.c. of the particular reagent added. In the chloride test, decinormal silver nitrate (or, to quote the stuffy phrase of the book, "tenth-normal silver nitrate V. S.") is directed. In both tests the liquids must be heated to boiling, cooled and filtered. For the actual purpose of these tests, boiling is not needed, and it is especially out of place in the case of the test for chlorides. The direction to filter the liquids before applying the second phase of the tests is also an excess. If the turbid liquids are stood aside for a short time (the chloride test in the dark), a few cubic centimeters of the clear liquid can be decanted and the test applied.

There seems to be a marked inequality between the limits allowed for sulphates (100 parts per million, calculated as SO_4) and chlorides (8·87 parts per million, calculated as Cl). These limits do not seem coördinated nor based on the study of analytic data.

For the nitrite test the naphthylamin reaction is given. This is a test of extreme delicacy, troublesome in application, at least so far as the preparation of the reagents is concerned. No caution is given as to the liability to error from the common occurrence of nitrites in air and dust, nor is it pointed out that deep waters will often give marked reaction for nitrites, and yet be unobjectionable. In fact, the whole water-rubric indicates that its authors are unaware that

the standards of purity in water are correlated with the class to which the water belongs. The tests for ammonium compounds and oxidizable organic matter are also under the same spell.

The absurdity of these standards for purity becomes still more glaring when the tests for distilled water are examined. The editor of this part seems to have an idea that the nitrates, nitrites and ammonium compounds often found in water are in themselves objectionable; whereas they are merely indexes of past impurity. In the case of distilled water, small amounts of the above compounds can have no significance. The application of difficult and delicate tests will produce nothing but confusion and, perhaps, the rejection of a sample that is entirely suited to pharmaceutic purposes.

It is certainly strange that those members of the committee of revision who have been for years in general analytic practice allowed such absurd rubrics to appear.

In a recent communication a member of the revision committee has endeavored to explain some of the features of the water-rubric, among others the allowance of 75 parts per million for fixed solids (in distilled water), for which the absurd requirement that 1,000 c.c. of water should be evaporated is again given. Seventy-five parts per million are equivalent to over 4 grains per United States gallon, an amount larger than that in many spring and river waters of the United States. As by further statement in this rubric, it appears that the water is not permitted to contain anything that is likely to be present, the total solids are more easily imagined than described. It will be interesting to know why a small amount of carbonic acid is objectionable, and also how the stock of distilled water, the container of which must be frequently opened to the air, can be prevented from acquiring some of this substance.

The above-mentioned defense of the water-rubric stated that the reason for allowing the large margin for the total solids is the action of water on glass. It may be said, however, that a sample which has dissolved so much of mineral matter is no longer pure water, and should not be approved as such. This reason for the liberal allowance sounds a little strange in comparison with a general requirement in regard to reagents, namely, that they should be kept in bottles not subject to corrosion by acids or alkalies. It will be found difficult to meet this requirement.

As an example of excessive elaboration of tests, I wish to instance

the rubric on apomorphin hydrochlorid. It gives the solubility of the salt in several liquids that would not be used for dissolving it in medical work, together with the melting and even the decomposing point, the latter certainly of little interest. Sixteen tests are given, several of them with unusual and expensive reagents, and almost all of them of interest and value only to the specialist in pharmaceutic chemistry or toxicology.

Some of the tables also exemplify the tendency to absurd and useless detail. Chemical calculations are carried out to the sixth decimal place, although it is well known that the atomic weights on which these calculations depend are not positive beyond the first decimal. In a tabular comparison of thermometric degrees, many equivalents are given to the fourth decimal, *e. g.*, 211·4444. For the general work of the analyst thermometers reading to one-tenth of a degree are the best available. To carry out the degrees to the ten-thousandth is mere arithmetical gymnastics, adding to the expense of the book without adding any advantage.

If I regard the Pharmacopœia in its present form as unsatisfactory to the analyst, it is in a still more unfavorable light that I regard it as a legal standard. Its errors of omission and commission in analytic methods can be supplemented by the knowledge of the worker or by regular analytical manuals, and, as a last resort, by special circulars and journal articles; but its errors as a work of authority must stand until remedied by the parent body. I regard the work as dangerous in its legal relations. I have known it to be an instrument of oppression. By its very nature it is liable to this misuse. In spite of all the circulation that it receives, it has a certain air of mystery. Its very name savors of the black art. A little knowledge of Greek informs us, of course, that it means merely "to make the drug," but Greek is the possession of but few.

The manner of publication of the book gives it a factitious authority and the use of the word "official" adds to this. We are reminded of Sir Joseph Porter's observation that "it is the characteristic of this happy country that official utterances are unanswerable." The book is supposed by many to represent the collective wisdom of medicine and pharmacy; but the method by which the convention is called destroys much of the dignity of it, for a general invitation is extended, including all grades of schools of medicine and pharmacy and of medical and pharmaceutic societies. The

great trade interests sure to be on the alert; they can afford to send a full complement of representatives and insist on their zeal and activity. Standards, therefore, may be framed to suit such interests.

A primary and inherent fault in the Pharmacopœia as a legal standard is the same as that pointed out with regard to its use by the analyst, namely, the infrequency of publication. Ten years, even five, is much too long an interval. Trade conditions change and these changed conditions should be met promptly and fully. The method of establishing standards by governmental proclamation is not wholly satisfactory, but it is much better than the system of establishing them by a book which can only be corrected by the formal action of more than two dozen persons scattered over a wide area.

The injustice that has been worked by the use of the Pharmacopœia as a legal standard has been so apparent that the framers of the current edition have made a formal statement that it is to be considered such only so far as the substances are used as drugs. It is a matter of doubt whether this waiver will avoid the trouble. In some of the laws enacted to prevent adulteration the statement is made, substantially, that an article sold under a name which occurs in the Pharmacopœia must conform to the requirements of that work. The law does not consider the *use* to be made of the article. Moreover, there is no certainty that all courts will concede the validity of the waiver. The law has its own methods which are not always foreseen or even comprehended by those not in that profession. In an Ohio case a druggist was charged with the sale of an article that did not accord with the then current (1890) Pharmacopœia, but did accord with the issue that was in use when the law was passed. A conviction was obtained, but a higher court set aside (and I think justly) the verdict on the ground that the Pharmacopœia mentioned in the act was the one in force at the time the act was passed and not some issue not in existence and of which the enacting body was unaware.

A definite instance of the ease with which the book can be used harshly was shown in a trial for selling "extract of vanilla." The sample did not conform to the standard for "tincture of vanilla" in the Pharmacopœia. The expert for the prosecution took the ground that this latter was the proper standard for preparations sold for flavoring purposes. He admitted, on cross-examination, that "ex-

tract of vanilla" is not referred to in the work but, nevertheless, maintained that it was covered by the title, and secured a conviction, which was, however, set aside and a new trial allowed. The Commonwealth never pressed the case to a second contest. The attitude of the judge and jury in this case was evidently due to the factitious authority that had been acquired by the work.

DOSES IN THE U.S.P.

By M. I. Wilbert,
Apothecary at the German Hospital, Philadelphia.

For the second time in the history of our National Pharmacopœia, doses have been appended to the monographs or descriptions of the official substances. The first attempt in this direction was made in connection with the first revision of the Pharmacopœia of the United States of America, published in New York, in November, 1830. In this early first revision of the U.S.P. doses were appended only to the articles that were enumerated under the heading "Materia Medica," while in the present eighth decennial revision doses are appended to all medicinal substances or preparations that are intended for internal use.

One other difference is to be found in the fact that in the present edition of the U.S.P. the figures that are given indicate the average adult dose, while in the first revision the usual variation of the doses is indicated.

The National Convention for revising the Pharmacopœia instructed the present Committee on Revision "To state the average approximate (but neither a minimum nor a maximum) dose for adults, and, when deemed advisable, also for children. The metric system to be used, and the approximate equivalents in ordinary weights or measures inserted in parentheses."

In following out these instructions the members of the Committee on Revision have appended average doses to 752 drugs and preparations. Twelve of these drugs and preparations have two widely varying quantities appended, thus making a total of 764 doses included in the present Pharmacopœia.

Of these 764 doses 405 are directed to be given by weight, 342 by liquid measure, 15 by count, while two, the doses appended to antidiphtheric serum, represent units of antitoxic power.

Just what the members of the present Committee on Revision consider to be metric quantities is perhaps best illustrated by a summary of the figures given in the Pharmacopœia as average doses, and an enumeration of the number of times that each quantity reoccurs.

Doses by Weight.				Number of Times Mentioned.
0·00015	gramme	= 1/400	grain	1
0·0003	"	= 1/200	"	1
0·0004	"	= 1/160	"	2
0·0005	"	= 1/128	"	7
0·001	"	= 1/64	"	5
0·002	"	= 1/30	"	3
0·003	"	= 1/20	"	3
0·005	"	= 1/10	"	8
0·008	"	= 1/8	"	1
0·010	"	= 1/5	"	17
0·015	"	= 1/4	"	5
0·030	"	= 1/2	"	16
0·045	"	= 3/4	"	2
0·065	"	= 1	"	32
0·100	"	= 1 1/2	grains	2
0·125	"	= 2	"	23
0·200	"	= 3	"	10
0·250	"	= 4	"	64
0·500	"	= 7 1/2	"	49
1·00	"	= 15	"	78
2·00	"	= 30	"	51
3·00	"	= 45	"	1
4·00	"	= 60	"	16
8·00	"	= 120	"	8
15·00	"	= 4	drachms	1
16·00	"	= 240	grains	8
30·00	"	= 1	ounce	1

Doses by Measure.				Number of Times Mentioned.
0.008	c.c.	= 1/8	minim	1
0·030	"	= 1/2	"	2
0·050	"	= 1	"	18
0·100	"	= 1 1/2	minims	15
0·200	"	= 3	"	40
0·300	"	= 5	"	6
0·5..0	"	= 8	"	28
0·600	"	= 10	"	3
1·00	"	= 15	"	63
2·00	"	= 30	"	62
4·00	"	= 1	fluid drachm	42
8·00	"	= 2	" drachms	25
15·00	"	= 4	" "	1

16·00	c.c.	= 4	fluid drachms	27
30·00	"	= 1	" ounce	4
60·00	"	= 2	" ounces	1
120·00	"	= 4	" "	3
360·00	"	= 12	" "	1

Doses by Count.

2 pills	11
1 pill	3
Set of two powders	1
Antitoxin units	2

A comparative review of the above table evidences the fact that the minimum average dose, for an official substance, is 0·00015, or 0·15 milligrammes. This minute quantity is the average dose given for the now official crystalline aconitine and is followed by 0 0003, the official average dose for strophanthin. The bulkiest dose for a solid is that given for pepo, 30 grammes.

The smallest official dose for a liquid is that for the volatile oil of mustard, given in the Pharmacopœia as 0·008 c.c., a quantity that, under present conditions would be rather difficult to imagine.

The largest official dose, on the other hand, for any of the official articles, is that given for the solution of magnesium citrate, 360 c c. A more careful, comparative study of the table of dose quantities must suggest the fact that the members of the Committee on Revision have not been particularly fortunate in the selection of the quantities that are supposed to indicate average doses in the metric system. Thus, for instance, we find such quantities as 0·008, 0 045, 0·065, 0·125, 0·60, 3·00, 4·00, 8·00, 16·00, 30·00, 60·00, 120·00, 360·00. Many of these recur repeatedly, but never once do we find such quantities as 5·00, 10·00, 25 00, 50·00 or 100·00.

This absence of decimal figures, in some instances, is the more apparent when we realize that the committee appears to have taken cognizance of the fact that decimal quantities are of advantage, and has selected 1·00 gramme or 1·00 c.c. as the unit of quantity in a very large number of instances. Thus we find that 1·00 gramme occurs no less than seventy-eight times while 1·00 c.c. occurs sixty-three times, as the average dose of official articles.

A slight discrepancy is also to be noted in the difference of opinion that appears to exist in connection with the quantities used to indicate the metric equivalents of 1 grain and 1 minim.

In giving the average doses by measure the committee has invariably given 0·05 c.c. as being the equivalent of 1 minim. In

giving the doses by weight the members of the committee have, apparently, been more exacting and give 0·065 as the equivalent of 1 grain; they do, however, give 0·01 as being the equivalent of 1/5 grain and 0·005 as being the equivalent of 1/10 of a grain.

In only two instances is the quantitatively more correct, and at the same time the more reasonably decimal, quantity 15·00, mentioned as being the equivalent of half an ounce; by weight for chondrus, and by measure for syrup of ipecac as an emetic.

Quite a number of additional features might be referred to in connection with the above table of dose quantities; what has been said, however, will serve to show that while the members of the Committee on Revision have succeeded in giving us a practical solution of the much-dreaded question of official doses, and while they have also contributed materially toward advancing the use of the metric system in medicine, in this country, they have not been altogether successful in the selection of quantities indicative of approximate, average metric doses.

In conclusion, it may be of interest to enumerate just a few of the doses included in the first revision of the U.S.P., published in 1820, comparing them with the quantities given as average doses, seventy-five years later, in the eighth decennial revision, published in 1905. To facilitate comparison all of the quantities are given in grains:

Name of Drug.	Dose in grains, U.S.P., 1830.	Dose in grains, U.S.P., 1900.
Aloes	5 to 15	4
Asafetida	5 " 20	4
Belladonna leaves	1 " 5	1
Camphor	5 " 10	2
Cantharides	½ " 1	½
Capsicum	6 " 10	1
Cinchona	10 " 240	15
Colocynth pulp	4 " 10	1
Colchicum	1 " 4	4
Cubebs	60 " 90	15
Digitalis	1 " 3	1
Ipecac	10 " 30	15
Jalap	10 " 30	15
Nux vomica	2 " 5	1
Opium	1 " 4	1½
Rhubarb	5 " 40	15
Senega	20 " 40	15
Senna	20 " 60	60
Squills	1 " 60	2
Arsenic trioxide	1/10 " ¼	1/30
Phosphorus	1/8 " ¼	1/128

THE PROTECTION THAT SHOULD BE AFFORDED THE PHARMACIST BY LAW.

By C. P. Gabell.

The world is ever ready for an advance, be it in inventions, in science or in trade. Once it grasps the fact that what is presented is an actual improvement, the success of that advance is assured.

The present condition of the pharmaceutical trade is open for improvement, and it rests with the pharmacist to present such an improvement to the public. Just what step should be taken or what should be done is a question which is being debated throughout the country and action being taken with the result that to-day we have an organization comprising the greater number of the pharmacists of the country. Several lines of action are being carried out with varying results, the main one being the endeavor to raise the price of patent medicines over the present existing prices, with the idea that the increased revenue would benefit the business; this measure will no doubt be beneficial, but only to a degree. I have never favored this action, because in it I can see no permanent good. It is a branch of the business which savors of deceit, has not the approval of the best and well-thinking minds, and to-day is being radically criticised by our magazine writers.

I have to present to you an idea which I have presented to individuals both laymen and pharmacists, and it has been received with approval by the majority. I favor action along legislative lines and offer this contention.

Pharmacists should be the dispensers of all poisons and products containing poisons to the laity. This carries considerable breadth in the statement and may be construed to be very radical, but when we go back to the inception of why a poison law was ever framed, we find it was not made to favor a few men in a chosen business or profession, but was intended to safeguard the general community from doing itself harm or causing others harm. We find that conditions existing to-day are the same as in the past; we find also that instead of poisons and allied products passing through qualified and experienced hands they are being dispersed indiscriminately by photo-supply houses, grocers, department stores, seed stores, hardware stores and others, to the detriment of that class of men who have qualified themselves to handle these articles intelligently.

In reading our present Pennsylvania pharmacy law, it states that only pharmacists shall sell drugs and poison, and dispense same; we read further and we find it says this shall not apply to anything used in the arts, so we have this condition existing: A person wants cyanide of potash, he comes to a druggist who makes the sale according to law and its requirements, which are burdensome, and soon that customer finds he can buy the same cyanide for the same or less money, outside of the drug business, without any burdensome questions or mortifying signatures. And what is true of this chemical is true of a host of others; for instance, all the dyestuffs, all the insecticides, the electrical chemicals, in fact, the volume of material which is sold by qualified drug and chemical men as compared with the volume of material used is infinitesimal, and I feel that what is needed to elevate and carry the drug business from its present dearth and sloth to a condition of prosperity is not an increase of profits as much as a re-collection of this lost business back into its proper channel.

In advocating my idea to people I have presented this argument: "The drug business is in a bad condition. We are not making money. Will you pay me $1 for what you are now paying 85 cents?" The invariable answer is: "Why, some men are making money in your line at the present prices, and if you are not bright enough to get the money out of your business, I cannot help you; as long as I can buy for 85 cents I will not pay $1." Again, "the drug business is in a bad way. We are men educated and specially qualified to sell poisons and articles containing poisons, and to sell them to you we are required to register your name, etc., but due to the faulty wording of the present law, you can obtain these articles with no inconvenience, from other dealers. Now, do you prefer that these unqualified dealers shall furnish this material, knowing they have not the necessary knowledge to caution you in their use and capable of satisfying themselves you understand fully how to handle the product without harm to yourself or others, or would you prefer these products to be handled by the qualified men?" And receive this answer: "By qualified men." "Will you help us by your influence and vote to secure this condition?" And the answer has been, "Yes."

A physician is a qualified man; so is a lawyer, minister, the saloon-keeper and the plumber. No man can enter these pursuits

without qualification either in the shape of a diploma, a license, or a registration. Any one doing so renders himself liable to fine and imprisonment; but the pharmacist is lured on to a college education and a diploma and graduates a qualified man to find his business usurped by the unqualified man without any redress at hand.

Some have said that my statement of poison and poisonous products for pharmacists would be class legislation, therefore unconstitutional. It is not class legislation any more than that which applies to lawyers, physicians and other classes referred to, and while it will help pharmacists it will help the general community more, the same as it has in the classes mentioned.

If you have been reading the public press you will find more and more cases of mysterious poisoning occupying the attention of the public, showing that the wide distribution of poisons outside of a regular channel is producing crime which is undetectable.

The present laws which are being pressed requiring a prescription from a physician I do not approve. It is simply taking the sale and distribution from the hands of the pharmacist and placing it in the hands of another set of men, practically saying pharmacists have not the moral courage to properly conduct their business; but physicians are such a higher type of men, they are the proper ones.

We are fined $100 for selling cocaine, but the physician may prescribe or sell it himself "ad libitum" without punishment. I offer you the criminal annals to prove if this be a good law.

Much has been said about the dispensing physicians; by the securing of such a law much of this evil would be remedied. The sentiment among physicians is against giving of their own medicines as it means extra trouble and expense; but what one does forces the other to follow. If such a law were established it would be unlawful for a physician to dispense, and while I am aware it would be next to impossible to stop the practice altogether, nor is such my intention, but the moral force of having such a law would bring it to its normal, healthy level, the same as our city ordinance against expectoration has brought spitting from a disgusting and unsightly abuse to a condition of fair cleanliness.

Another point which appeals to all sane men is that no one man can know it all, and there is a place for the special work done by the pharmacist. As a suggestion along the lines I am following would it not be well for our Board of Pharmacy, while bothering

themselves to know if every man calling himself a druggist is employing qualified help in the shape of Q. A. and P. D. back of his prescription department, to determine if the same class of work is being done by the same class of men in our manufacturing plants, thereby fulfilling the present law and bringing about an equitable cost of production between the manufacturer and retail pharmacist. This is only a suggestion. Also, do dental companies employ a registered pharmacist in their drug departments, and if not, why not, under our present law? Also, are the many preparations put up and sold by chiropodists, barbers, manicurists, great numbers of which contain poison, prepared by themselves or qualified men? And is the sale of such preparations legal?

Much complaint is heard of the lack of competent help. Time was when men paid to have their sons learn the trade. Why? Because it was understood to be a law-protected business carrying with it a fair remuneration and the highest social position. To-day all that may be offered is a nominal salary of $16 to $18 a week after graduation with only a slight advance over these prices in remuneration as a proprietor. Any movement for reform to meet with proper approval must have an underlying principle of a moral or ethical character; pure mercenary motives seldom achieve success, and until the pharmacists of the country become alive to the fact I look for little improvement from our organization.

Gentlemen, the druggists of the country to day need to make *poison* their watchword. *Poisons.*—We are the sellers and dispensers of poisons to the laity; nobody else should handle same. Our qualification and diploma give us this privilege and so must the law. The day for being the compiler of physicians' prescriptions only, has passed; the manufacturing pharmacist with his machinery has changed this, but as a distributor of poison and poisonous products in your neighborhood you have a place; it is a place which may have to be fought for, but when attained we will have more use for college-bred men. We will have control of all patent medicines and innumerable articles which we have not now, and then our organization, working on a solid foundation with a trade which controls its products by law, can talk the betterment of prices and trade conditions with some assurance of success.

You then will not stand before the public as sellers of 5 and 10-cent articles, cigars, soda water and penny-worth of candy, but

will be able to take your place socially among physicians and your fellow men.

With our trade organization, our colleges, the assistance of all right-minded physicians and the enlightened public, there is no reason why such a law should not be passed and the business, or profession as it really is, re-established and take its proper place in the community: The care of the sale and the distribution of *poisons* and *poisonous* products.

BOOK REVIEWS.

The Practice of Pharmacy. A treatise on the modes of making and dispensing official and unofficial, and extemporaneous preparations, with descriptions of medicinal substances, their properties, uses and doses. Intended as a hand-book for pharmacists and physicians and a text-book for students. By Joseph P. Remington. With over eight hundred illustrations. Philadelphia: J. B. Lippincott Company. London: 5 Henrietta Street, Covent Garden.

It is exactly twenty years since the first edition (October, 1885), of Remington's Practice of Pharmacy was published. The first edition was written after the author had been Professor of the Theory and Practice of Pharmacy in the Philadelphia College of Pharmacy for eleven years. The time was ripe for the publication of a book which could at once be used by the student or apprentice in qualifying himself for his professional work and by the pharmacist as a work of reference.

It is usually conceded that no other work on pharmacy has had such a large sale, and this sale must be taken as a measure of its success and general merit. It is adapted to the needs of a larger number, and contains probably a larger amount of general information, which the pharmacist is likely to need in the course of his ordinary routine business than any other book on pharmacy that has been published. In fact, besides being primarily a treatise on the principles of pharmaceutical practice, it is more or less of a dispensatory or commentary on the Pharmacopœia without its being burdened with much of the matter contained in the dispensatories, which is only occasionally referred to. Besides containing practically everything in the U. S. Pharmacopœia, it contains the formulas of the National Formulary, a formulary of unofficial preparations

and considerable useful information on various non-official chemical substances, as well as articles of the vegetable materia medica.

Nearly three hundred pages are devoted to the discussion of the various pharmaceutical operations, as distillation, solution, filtration, percolation, etc. Over two hundred pages are given to the consideration of magistral or extemporaneous pharmacy, this part having been enlarged by the addition of a new chapter on "Incompatibility," the insertion of new illustrations of autograph prescriptions and numerous new cuts of apparatus, together with descriptions of the same.

There are certain inaccuracies in the book which are of a technical or scientific nature, and while they are not likely to interfere with the usefulness of the book as a working guide, mar it to a certain extent when considered as a work of reference. Under Linum (p. 749) it is stated that the fixed oil is "in the nucleus." While the term "nucleus" was used at one time to designate the kernel of a seed, it is now limited entirely to one of the organized bodies of the cell. The distinction between starch and inulin given on page 744 is not entirely correct. "*Stylidaceæ*" (p. 744) should be "*Stylidiaceæ*," or better, "*Candolleaceæ*." Canna (p. 744), instead of belonging to the *Marantaceæ*, is now classed as a member of the *Cannaceæ*. "*Protococcus vulgaris*" (p. 752) should be "*Pleurococcus vulgaris*." "*Calamintha clinopodium*" (p. 813) should be "*Kœllia incana*." Bael fruit (p. 750) belongs to the *Rutaceæ* and not to *Aurantiaceæ*, as stated. These references are probably sufficient to indicate some of the improvements which might be made in a future edition.

Bacteria in Relation to Plant Diseases. By Erwin F. Smith, in charge of Laboratory of Plant Pathology, Office of Physiology and Pathology, Bureau of Plant Industry, United States Department of Agriculture. Volume I. Methods of work and general literature of bacteriology, exclusive of plant diseases. Washington, D. C.: Published by the Carnegie Institution of Washington, September, 1905.

Dr. Smith ranks as one of the foremost bacteriologists of the day, and he is rendering science a distinct service in giving not only the results of his own researches and experience for the last fifteen years, but also those gained by extensive reading and searching of literature, in the volumes which are to constitute this work, the first

of which we now have the opportunity of reviewing. It is not a text-book that is being written by Dr. Smith, for it has none of the limitations of the text-book. Nor, on the other hand, is it an encyclopedia, for the matter is not abbreviated as in an encyclopedia. It is in fact a reference book of reference books, giving evidence that all of the matter has been thoroughly assimilated, and that scissors and paste have had no part in its construction. It represents the actual thought and experience of one who has long been working in the laboratory and in the fields, and if other writers on this and other subjects would follow his example, we would have fewer and better books, and thus much time would be saved the scientific worker, which is indeed a part of his capital.

The volume before us is divided into two parts:

I. Outline of methods of work. Some two hundred and two pages are given to the presentation of this part, and the subjects discussed include the following: (*a*) The disease; (*b*) the organism in its pathogenesis, morphology and physiology; (*c*) economic aspects; (*d*) general considerations including the location, equipment and care of the laboratory; (*e*) preparation and care of culture media, cleaning and sterilization of glassware and instruments; (*f*) making and transference of pure cultures; (*g*) formulæ for stains, etc., etc.

II. Bibliography and Literature. To this part one hundred and sixty-five pages are devoted, the matter being arranged under fifty-two heads, some of which are indicated as follows: (1) Journals; (2) transactions, Beiträge, Jahresberichte, Festschriften, etc.; (3) manuals; (4) physical, chemical, zoological and botanical works of special use to the plant pathologist; (5) books and papers of more or less general interest; (6) important books and papers on special human and animal diseases; (7) predispositions, conditions favoring infection or immunity; (8) symbiosis and immunity; (9) carriers of infection; (10) general morphology of the bacteria; (11) spores; (12) flagella; (13) capsules; (14) stains and staining methods; (15) morphological and physiological changes due to changed environment; (16) culture media; . . . (21) ptomaines, toxins, antitoxins, serums, phagocytosis; (22) attenuation, virulence; . . . (38) antiseptics and germicides; . . . (46) bacteria in water and ice, dung bacteria, etc., etc.

In connection with the titles of papers Dr. Smith frequently gives

brief abstracts, and in some cases where the original is not readily accessible, he gives an extended abstract. The writer does not know whether Dr. Smith intended to give a complete bibliography of the more authoritative and important works on bacteriology or not, but if he did one wonders why such an important manual as that by Prof. Arthur Meyer, of Marburg, was not included.

This work of Dr. Smith's is probably the most comprehensive that has yet appeared on this subject, and to the writer's mind is the most valuable.

PHARMACEUTICAL MEETINGS OF THE PHILADELPHIA COLLEGE OF PHARMACY.

DECEMBER.

The third stated Pharmaceutical Meeting of the Philadelphia College of Pharmacy for 1905–06 was held on Tuesday afternoon, December 19th, with William McIntyre in the chair.

Prof. Henry Leffmann, the well-known chemist and author, was the speaker of the afternoon, and gave a talk on "The U. S. Pharmacopœia from the Point of View of the Analyst and as a Legal Standard." (See page 77.)

In discussing the address M. I. Wilbert spoke, in part, as follows:

"To pharmacists who are at all interested in advancing the status, as well as the use, of the Pharmacopœia, it must be evident that the very attempt at making the book a comprehensive text-book on the sciences relating to pharmacy, not alone tends to increase the size as well as the price of the Pharmacopœia, but is also the one factor that has evidently delayed the publication of the last edition.

"While we no doubt feel that the Pharmacopœia is, or at least should be, the generally accepted standard for the drugs and remedies that are used in the treatment of disease, we must not forget that of the 140,000 physicians and upwards of 40,000 pharmacists of the country, who should have an intimate knowledge of the contents of the Pharmacopœia, less than 10,000, or about 5 per cent. of the total, were supplied with the book on September 1, 1905, the date when the eighth decennial revision of the Pharmacopœia is supposed to have become official."

Charles H. LaWall spoke of the recurring tests for various salts,

as of chlorides, and said that much space could have been saved by giving these in some one place and referring to them as need be under the chemicals. He expressed the opinion that some of the tests, as, for example, those for esters under essential oils, are too complicated for practical purposes.

W. L. Cliffe remarked upon the subject of the Pharmacopœia as a legal standard, and said that the law governing the adulteration and sophistication of drugs in Pennsylvania is in the hands of the State Board of Pharmacy, and that it is the consensus of opinion of the members of the Board that the Pharmacopœia is the best available standard for their purpose without framing enactments for every article. He said that the law refers to the latest edition of the Pharmacopœia, and, as administered, has never wrought any hardships. He said that in the case of litigation referred to by Dr. Leffmann the question should have been asked as to whether the article in question was sold as a food or medicine, the Board of Pharmacy regarding the Pharmacopœia as a standard for drugs only.

Referring to the subject of doses, Prof. C. B. Lowe said that he considered those of the new Pharmacopœia to be rather low, that they are hardly average doses.

Charles H. LaWall called attention to a sample of Bombay mace which he said had no spice value; and also to some dried pistachio nuts derived from *Pistachia vera* and *P. lentiscus*.

Joseph W. England exhibited a sample of powdered Java cinchona which he obtained from the Powers-Weightman-Rosengarten Company, and which he said contained from 10 to 12 per cent. of alkaloid estimated as quinine sulphate. He said that fully 95 per cent. of the cinchona bark on the market is derived from the cultivated cinchona trees in Java, and that the cinchona market of the world has changed from London to Amsterdam. He said that the system of mossing the bark is not so much in vogue as formerly, the present practice being to cut down the bark-yielding trees and to plant an equivalent number, or more, of selected trees each year. By this method it is possible to increase the content of quinine in the cultivated barks, and it is not unusual for the yield of alkaloid to be equivalent to 12 or 13 per cent. of quinine sulphate. The mossing system was done away with because the increase in quinine was not permanent and because the trees rotted very readily.

JANUARY.

The regular monthly pharmaceutical meeting of the Philadelphia College of Pharmacy was held on Tuesday afternoon, January 16th, with Freeman P. Stroup, president of the Philadelphia College of Pharmacy Alumni Association, in the chair.

The first speaker was Edwin Leigh Newcomb, P.D., Instructor in Botany and Pharmacognosy in the Philadelphia College of Pharmacy, who gave an interesting talk on "A Trip to California, and Some Observations on Pharmacy by the Way," which was illustrated by a large number of specimens of vegetable products, which he presented to the College. This trip included a visit to the Yellowstone National Park and the Lewis and Clarke Exposition. Of the specimens which were exhibited, the following are of pharmaceutical interest: The leaves and fruits of several species of Eucalyptus including *E. globulus*, *E. robusta*, etc., the flowers and fruit of *Olea europæa*, the galls of *Quercus lobata*, roots and leaves and parts of the trunk of the Washingtonian palm (*Washingtonia filamentosa*). the flower stalk of *Agave americana*, the flowers and fruit of pomegranate. The exhibit also included a number of fruits which were shipped by freight in tin fruit-cans and preserved by means of saturated solution of sodium chloride, of which the following may be mentioned: almonds, prunes, plums, lemons, English walnuts. Referring to the condition of pharmacy in the West, the speaker said that he visited a number of drug stores, and that they gave evidence of prosperity, and that the proprietors seemed to be alert to the needs of the profession and to favor progressive measures.

"Compound Solution of Cresol" was the subject of a paper presented by Charles H. LaWall, Ph.M., and E. Fullerton Cook, P.D., of the Pharmaceutical Department of the College. The authors called attention to the fact that the formula for this solution as given in the new Pharmacopœia will not give a satisfactory product unless the solution be allowed to stand for about three weeks in order that complete saponification may take place. To overcome this objection they suggested first making a soap and then adding it to the cresol.

E. M. Boring exhibited a sample of compound solution of cresol, in which saponification had been effected by allowing the mixture to stand five weeks, and keeping it at a temperature in excess of room

temperature. Mr. Boring also exhibited a sample of the official elixir of iron, quinine and strychnine phosphate, which was a yellowish color rather than green, due probably to over-neutralization as suggested by M. I. Wilbert.

M. I. Wilbert said that the fact that the Pharmacopœia requires cresol to answer the test for absence of phenol makes the compound solution of cresol an expensive preparation. In commenting on the formula for this preparation, he said the Committee of Revision might have availed themselves of the more satisfactory formula of the German Pharmacopœia. He said that many of the preparations of this class which produce milky solutions are made from the crude oil from which phenol has been separated, and that the milkiness is due to the presence of naphthalene. FLORENCE YAPLE,

Secretary pro tem.

PHILADELPHIA COLLEGE OF PHARMACY.

MINUTES OF THE QUARTERLY MEETING.

The quarterly meeting of the members of the Philadelphia College of Pharmacy was held December 26, 1905, in the Library, at 4 o'clock, the President, Howard B. French, presiding.

Twelve members were present.

The minutes of the Semi-annual Meeting, held September 25th, were read and approved.

The minutes of the Board of Trustees for September 15th, October 2d, and November 8th, were read and approved.

Thomas S. Wiegand called the attention of the members to the analytical balance and the large number of books on the table belonging to the late President Charles Bullock, which were donated to the College by his son, William A. Bullock. In the collection were the "Original Notes on the Investigation of Veratrum Viride." President French, in accepting the gift, said the College was highly honored in obtaining such a valuable accession to its Library from one who had labored long and earnestly for its welfare. Mahlon N. Kline moved that the thanks of the College be tendered to William A. Bullock for the gifts. Unanimously carried.

The President announced the death of two life members: John Bley—elected in 1868; his death occurred at Los Angeles, Cal., August 22, 1905. Buried at South Laurel Hill, October 17th. Allen Shryock—elected in 1870. A paper prepared by Mr. Shryock was read at the Pharmaceutical Meeting in October; his death occurred at Philadelphia, November 14th.

ABSTRACTS FROM MINUTES OF THE BOARD OF TRUSTEES.

September 15, 1905.—Committee on Property reported that the building had been thoroughly cleaned and in good shape for the approaching session. Committee on Library reported a number of accessions to the Library. Committee

on Instruction reported that Professor Lowe had suggested the name of Dr. Alfred Heineberg, a graduate of the College, as his assistant; whereupon he was duly elected. Committee on Examination reported the names of Joseph C. Carlin, Francis C. Handwork, P.D., Charles J. Heinle, Merrill B. Hile, William H. King, John G. Roberts and Frederick W. Steigerwalt, special students in Chemistry, as being entitled to the award of the Certificate of Proficiency in Chemistry, they having successfully passed the prescribed examinations. After consideration, the Board authorized the awarding of certificates. The amendments to the By-Laws, proposed at the meeting in May, relating to entrance examination, were separately acted upon and adopted. C. L. Bonta was elected to active membership.

October 2, 1905.—Committee on Announcement read a financial statement relating to the issuing of the Eighty-fifth Annual Announcement. Professor Moerk reported the receipts and expenditures of the Chemical Laboratory for the year ending August 31, 1905. Class instruction was given to 138 second-year students, 124 third-year students, individual instruction to 86 students and 24 special students received instruction. John J. Finney was elected to active membership.

November 8, 1905.—Committee on Library reported a number of accessions to the Library. Committee on Scholarship reported the names of seven students to whom scholarships were awarded.

C. A. WEIDEMANN, M.D.,
Recording Secretary.

NOTES AND NEWS.

THE CHEMICAL ENGINEER is a newly established monthly journal of practical, applied and analytical chemistry. The editor is Richard K. Meade, with editorial offices at Nazareth, Pa. A list of special contributors together with the subjects assigned to each is also announced, as follows: W. H. Walker, "Chemical Engineering;" William M. Booth, "Chemical Engineering;" Samuel P. Sadtler, "Industrial Organic Chemistry;" Porter W. Shimer, "Iron and Steel;" Geo. P. Maury, "Iron and Steel;" Robert Job, "Engineering Chemistry;" Robert E. Divine, "Soap and Glycerin;" Edward C. Worden, "Dyes and Textile Chemistry;" William H. Teas, "Leather and Tanning;" L. W. Wilkinson, "Sugar;" William H. Easton, "Electro-chemistry;" Albert H. Welles, "Food and Food Analysis;" Thorne Smith, "Copper;" Albert V. Bleininger, "Ceramics."

THE JOURNAL OF BIOLOGICAL CHEMISTRY has recently made its appearance, with Drs. J. J. Abel, of Baltimore, and C. A. Herter, of New York, as the responsible editors. The pages of this journal are open

(1) To workers in zoology and botany and the branches of knowledge in which these sciences are applied, for such of their researches as are of a chemical or physico-chemical nature. (2) To workers on the chemical side of the experimental medical sciences, as physiology, pathology, pharmacology, hygiene, physiological chemistry and bacteriology. (3) To those who are engaged in any branch of clinical medicine, when their researches are of a chemical nature. (4) To the specialist in organic chemistry, who will find here a fitting place for the publication of researches which have biological or medical interest.

John Attfield

THE AMERICAN JOURNAL OF PHARMACY

MARCH, 1906.

PROFESSOR JOHN ATTFIELD, F.R.S.

A BIOGRAPHICAL SKETCH.

BY F. A. UPSHER SMITH.
Pharmaceutical Chemist.

In the following short biographical sketch, written at the request of the editor, an attempt is made to outline the career of one who for over forty years has taken a leading part in the efforts that have been made to promote the advancement of pharmacy. To an American audience no apology is needed for bringing to their notice the name of John Attfield, an Englishman, who was paid the great compliments of being elected in 1869 a corresponding member, and in 1884 an honorary member of the Philadelphia College of Pharmacy by whose authority the AMERICAN JOURNAL OF PHARMACY is published. He is now the senior of the nine existing honorary members of the American Pharmaceutical Association, having been elected in 1871.

The task of writing a biographical sketch of one who is still living is not always easy, since the publication of too full details may offend the subject of the sketch, while the barest outline may not satisfy the reader. In the present case, there is no difficulty in steering a middle course. We have to record the greater part of a busy life chiefly spent in investigating, teaching and writing the truths of science as applied in the domain of pharmaceutical chemistry. The lapse of years is usually necessary before the proper niche in the temple of fame is assigned to any worker. The early biographer's task is therefore simplified. He needs simply to record facts, leaving future generations to draw deductions therefrom.

John Attfield was born on August 28, 1835, near Barnet, in the County of Hertford, where his ancestors had lived for many genera-

tions. The family name, originally "At-the-Field," is an uncommon one, so that little difficulty is found in tracing the family back to the fourteenth century. He owed his early love for scientific pursuits to his schoolmaster, the Rev. Alexander Stewart, then of Barnet, who lectured occasionally to his boys on chemistry and physics. Towards the close of the lad's school days the usual momentous question arose as to the choice of a vocation. He begged his father to enable him to follow up his studies in chemistry and physics. The family medical man was consulted on the matter, and he replied, "Article him to some member of the Pharmaceutical Society who makes most or many of his own preparations of drugs and some chemicals, and who practises analysis, so that if a livelihood should not present itself in chemistry and physics your son can fall back on pharmacy." This advice was followed, and the authorities at Bloomsbury Square helped in the finding of such a man (more common, alas! then than now). This was Mr. William Frederic Smith, a manufacturing chemist at Walworth, London, who further undertook, when he had taught his pupil what he knew of chemistry and physics and the art of pharmacy, to send him to classes at the Pharmaceutical Society's school, an arrangement which proved to be eminently satisfactory. Five busy years were spent working in gaining pharmaceutical experience, and during the last of these in attending as well classes at the School of Pharmacy. He passed the minor examination in 1854 with honors, and in the school took first prizes in all subjects, namely, the medals in chemistry and pharmacy, botany and materia medica. He was disqualified by age for entering for the major examination. An opportunity soon presented itself of devoting himself more closely to his favorite subjects. He obtained the position of junior assistant to Dr. Stenhouse, F.R.S., lecturer on chemistry in the medical school at St. Bartholomew's Hospital in September, 1854, and subsequently became demonstrator of chemistry at the same hospital. His connection with St. Bartholomew's lasted until 1862. During this period he devoted a considerable portion of his leisure time to literary occupations, which have always formed so important a part of his labors. He contributed some 200 articles to the English Cyclopædia, dealing chiefly with pharmaceutical chemistry. He also contributed the results of original research on various subjects. Of these the most important was a paper on "The Spectrum of Carbon," which was read at a meeting of the

Royal Society in 1862. This year would appear to have been at once the busiest and the most eventful of his life. In January of that year he was elected a Fellow of the Chemical Society, and later he made his first appearance as an analyst in a court of law in a case of poisoning by strychnine. In the summer of 1862 he was elected to the Chair of Practical Chemistry in the School of Pharmacy of the Pharmaceutical Society of Great Britain. Among the competitors for this post was Mr. (afterwards Sir) William Crookes, F.R.S. He then betook himself for a few months to Germany in order to obtain a degree. From the University of Tübingen he obtained the degrees of Master of Arts and Doctor of Philosophy. His paper on the carbon spectrum drew highly complimentary remarks from the examiners.

Professor Attfield had now entered upon what was to prove one of the chief occupations of his life. Possessed as he was of a retentive memory and a broad grasp of his subject, he filled with distinction the position to which he was elected. He set himself to develop and cultivate the intellectual powers of his pupils, rather than to cram them with facts. The records show that during the thirty-four years of his professorship no fewer than 2,367 students passed through his hands. Many of these subsequently distinguished themselves in their calling. Indeed, very large numbers of the British researches in pharmaceutical chemistry during his tenure of the professorship were conducted by his old students. The retentiveness of Professor Attfield's memory, to which we have referred, is well illustrated by the fact that he remembered the face, and in nearly every case, the name of each of his old students. The necessity of publishing a trustworthy text-book of practical chemistry was soon felt, and to this task he now devoted his attention. Taking as a basis some manuscript notes which he had prepared for the students at St. Bartholomew's he endeavored to combine the outlines of the principles of chemistry with the details of practical work. The result of his labors was the production in 1867 of the first edition of his "Manual of Chemistry." Its popularity is great on both sides of the Atlantic, the eighteenth English edition, edited by Dr. Leonard Dobbin, appearing in 1903. When a demand arose for the book in America, in May, 1870, the late Mr. William Procter, Jr., Mr. Ebert, of Chicago, and Mr. Markoe, of Boston, called on Mr. H. C. Lea and arranged with him the details as to the publication

of the manual in the United States. Since then seven editions have been adapted to the United States Pharmacopœia, and the eighth, that is, the nineteenth of the consecutive editions, is now in course of preparation. The total number of copies of the manual issued up to the present time is between 50,000 and 60,000.

One of the principal projects in which Professor Attfield has interested himself is the British Pharmaceutical Conference, of which he was one of the founders. The first annual meeting was held in 1863 at Newcastle-on-Tyne. The objects of the Conference were to promote pharmaceutical research and good fellowship among its members. These objects have been achieved with a success which the founders of that body probably never quite anticipated. The yearly meetings of the Conference have always been well attended, and over a thousand valuable scientific communications have been read before its members. In addition, this Association has published a "Year Book of Pharmacy," containing not only a full report of its meetings, but a digest of the scientific work bearing on pharmacy which has been published in other countries. The editorship of the Transactions was entrusted to Professor Attfield and retained by him for many years. For seventeen years after its inception, Professor Attfield was senior secretary of the Conference, and according to the testimony of Richard Reynolds and Henry B. Brady, the two other chief organizers, its large success owes much to his efforts. On relinquishing, in 1880, his official connection with the Conference as its honorary secretary, Professor Attfield was presented by the members of the Conference with 500 volumes of general literature, chosen by himself. The late Mr. Schacht, in making the presentation, referred in eulogistic terms to the past work of the retiring secretary. "Broadly speaking," said he, "it appears to me that the usefulness of our friend's life has consisted in this, that he first of all achieved a high and distinguished position for himself, and from that moment has endeavored to hold up both for our admiration and achievement that higher life of mental culture which is so plainly open to us in the very nature of our calling, but which we are so prone to forget amidst the pressure of business. It seems to me it has been in that constant protest against pharmacists sinking into anything like perfunctory drudges, and in his recommendation of the only genuine remedy for that, namely, that each man should do something, or at least try to do something, for the general good, that the main influ-

ence for good of Professor Attfield's life has rested." He was afterwards President of the Conference in 1882–4.

Professor Attfield was now in the prime of life and was about to embark on those pharmacopœial labors which were to form so great a part of his life's work. But the scope of his activities throughout has been very wide. In 1864–5 he devoted considerable time to a revision of much of the chemistry of Brand's "Dictionary of Art, Science and Literature," and in 1866 he found time to revise and extend the chemical portion of the fourth edition of Clegg's work on the "Manufacture and Distribution of Coal Gas." The value of the metric system appealed forcibly to his practical mind. He keenly advocated its adoption in this country in place of our complex system of weights and measures, and at one time occupied a seat in the Council of the Metric Decimal Association. In addition he has published seventy original papers, the majority dealing with the results of his researches in chemistry and pharmacy, a list of which, to the year 1894, is given in Reber's "Gallerie hervorragender Therapeutiker und Pharmakognosten."

Professor Attfield was, in 1882, appointed by the General Medical Council to be one of the three editors of the 1885 edition of the British Pharmacopœia. After the appearance of that work he became successively annual reporter on the Pharmacopœia to the Medical Council, sole editor of the "Addendum" of 1890, of the "British Pharmacopœia" of 1898, and of the "Indian and Colonial Addendum" of 1900. The first digest of criticisms of the 1898 Pharmacopœia was edited by him in 1900, this being his last work in the capacity of "Reporter on the Progress of Pharmacy and Adviser on Pharmaceutical Chemistry." To him is due the union of pharmacists with the physicians in the compilation of the Pharmacopœia. He was the originator, in 1886, of the conversion of the hitherto nationally compiled Pharmacopœia into an imperially compiled Pharmacopœia. He himself largely organized the imperialization of the Pharmacopœia. The carrying out of this editorial work was a delight to one so gifted with organizing powers. It would occupy too much space to detail here the complex machinery which he set in motion. The story of the making of a Pharmacopœia would in itself form instructive and interesting material for a separate article. Suffice it to say that the Pharmacopœia was divided into seven sections, and of some of these as many

as seven separate proofs were sent out to the members of the Pharmacopœia committees of the General Medical Council and the Pharmaceutical Society. In each case at least four proofs were submitted; the first for general examination and for any additional adaptations of general principles, the second for revision, the third for provisional acceptance, and the fourth for confirmed acceptance. Each separate set of proofs was carefully examined by the editor when returned, and the suggestions and corrections were incorporated in his own copy for the printer. The writer was privileged at the time to render some little assistance to the editor in the library of his private house, the headquarters of the editorial work, and remembers particularly seeing a large, strong room in the basement, provided with shelves, on which were carefully arranged each set of proofs which had been employed in the production of the work, and annotated by the medical and pharmaceutical compilers, as well as all the correspondence connected with the undertaking. As illustrating the strong practical bent of the Professor, it is interesting to note that trays of freshly burnt lime were kept on the shelves for the purpose of keeping dry these valuable papers relating to the formation of the Pharmacopœia. As a result of this careful filing of documents, the editor could at a moment's notice trace any change in the Pharmacopœia back through all its transformations to the original suggestion. The nine annual reports (1886–94) on the Progress of Pharmacy in relation to the revision of the 1885 British Pharmacopœia, prepared by him for the General Medical Council, form a model of method and thoroughness. The editor took care that all original and trustworthy pharmaceutical work should be reflected in the pages of these reports. Considering the years of labor which he spent on the Pharmacopœia, it is not surprising that on one occasion at least it formed the subject of an address. The paper was entitled "The Pharmacopœia as a Student's Manual." The occasion was an introductory address delivered before the Students' Association of the School of Pharmacy of the Pharmaceutical Society of Great Britain in 1882. This address was reprinted at the time for distribution, and in a masterly manner showed the student how best to understand the Pharmacopœia, the complexity of its composition, and the necessity for the student to be familiar with the various sciences allied to pharmacy.

The Professor has always been felicitous as a maker of phrases.

Thus, he described pharmacy as "a mosaic of arts and sciences, of the chief details of which the Pharmacopœia is an index or catalogue." This address, which deserves reprinting into various languages for the benefit of students of pharmacy in all countries, concluded with a paragraph of caution and of encouragement. "If this short address should meet the eye of any pupil in pharmacy who thinks that the calling will not pay for such effort as is here shadowed forth, let him be confirmed in his idea. The effort will never repay *him*. Let him quit the calling. He has already lost enough time and money in following it; he will lose more if he remain. To the pupil whose heart is in his work, and who believes that such endeavors will bring a commensurate reward, to him due reward will come. Future success in pharmacy will lie with those best educated. In conclusion, I will only add that the most accomplished pharmacist owes most to the Pharmacopœia, and considers himself bound according to his opportunities to do his best to maintain its value. A true student of the Pharmacopœia, he never ceases to be its student. But his attitude towards it of thorough loyalty ever merges into one of good and intelligent scepticism: an attitude which provokes sound experimental research and results in improved processes and products."

Reverting to the Imperial Pharmacopœia, the Medical Council adopted his suggestion to extend the Pharmacopœia so that it might be of use to the Colonies and India. The work of imperializing the Pharmacopœia proved heavy, as some seventy dependencies had to be communicated with. It was felt that in many colonies there were indigenous drugs that might be used in the place of those official in the British Pharmacopœia, and so save the cost of importing. The wisdom of this step has quite recently been accentuated by the researches of Dunstan and Cash, who have shown that indaconitine and bikhaconitine, derived from Indian aconites, may be used instead of the aconitine from *A. napellus*. Professor's Attfield's work on the Pharmacopœia was officially appreciated. On May 31, 1898, the General Medical Council, on motion from the chair, passed a vote of thanks "to the editor, Dr. Attfield, for all that he has done to make the Pharmacopœia complete and accurate." *The Lancet*, commenting on this graceful act, said: "The whole profession will endorse the special vote of thanks awarded by the Council to Dr. Attfield."

On retiring from the Chair of Practical Chemistry at the School of Pharmacy, the Council of the Pharmaceutical Society accorded him the unusual honor of a vote of thanks. His former students marked the occasion of his retirement from the chair, which he had occupied 34 years, by presenting him with a testimonial. Mr. John Moss was the secretary of the Testimonial Committee, and over 1,000 old students and some 250 public scientific leaders responded to his invitation, suggesting the presentation of a mark of esteem. The testimonial took the form of a silver tray and a silver tea and coffee service, with a large and very beautiful album containing the actual signatures of the subscribers. The album contained an inscription from which a paragraph may appropriately be copied. "During the whole of this long tenure of his important office Professor Attfield not only won and retained the respect of successive generations of students by the lucidity, accuracy and thoroughness of his teaching, but he also endeared himself to them by his unfailing tact, kindness and urbanity. Not less successfully did he serve pharmacists and medical practitioners, and through them the public, by his versatile ability, untiring energy and power of organization as an editor of the Pharmacopœia and author of a manual of chemistry, and, generally, as a worker who unceasingly applied the resources of the great science of chemistry to the demands of the great art of healing." A portrait of the Professor had been produced by Hubert von Herkomer, C.V.O., R.A., his friend and neighbor, and since that day related to him by a marriage in the two families. At the presentation ceremony Mr. Moss spoke of the Professor in terms which give a more vivid pen-picture of the Professor than the writer could hope to do. Calling attention to an engraving of the portrait by Herkomer, a copy of which was presented to each of the subscribers to the testimonial, Mr. Moss said: "It is the face of a man of science, who, looking at a problem, regards it as a thing to be solved, and solve it he will. The features, firm and thoughtful, kindly and sympathetic, will recall to those to whom it goes hundreds of miles away from this place, the attractive face of one who has endeared himself to them by many acts of kindness and attention. It is the face of a man adept at smoothing away students' difficulties, whether in the study of theory, or in the practice of difficult manipulation. Seen close to, firmness and thought predominate.

At a short distance the expression seems to soften, and two or three yards away will be visible the genial humor that lurks in the eye and the corners of the mouth, ready to blossom into a smile under the warming influence of a friendly eye."

Fortunately for Professor Attfield, he has always consistently developed the social side of life. The Chemists' Ball, the Football and Cricket Club, the Students' Association, and the annual Old Boys' Dinner and Smoking Concert in connection with the School of Pharmacy are among the now cherished and flourishing institutions which he had so large a hand in founding and making successful.

We have now completed a review of the main incidents in Professor Attfield's public life. After his retirement from the Chair of Practical Chemistry and the cessation of his pharmacopœial labors he has enjoyed a well-earned retirement at his beautiful home at Watford, Herts. Though more than seventy years of age, he retains alertness and vivacity, and takes the same keen interest as ever in matters pertaining to pharmacy. There are few men to whom it is granted in a fuller measure than to Professor Attfield to see the fulfilment of their life-work. As pharmacist, author and professor he has succeeded in his aims; the proofs of this are seen in his published researches, his Manual of Chemistry, his editorial labors on two successive British Pharmacopœias, and his thirty-four years' successful occupation of the Chair of Practical Chemistry of the Pharmaceutical Society of Great Britain. In addition, his official standing in pharmacy gained for him a large and lucrative consulting practice. To all his undertakings he devoted an untiring energy and a capacity for work seldom equalled. The secret of his busy life may be said to consist in the methodical allotment of the hours of work and recreation, and the avoidance of haste and excitement. His success as a teacher will be readily understood by those who have read the preface entitled "Advice to Students" in the Manual of Chemistry, concluding with these words: "Students, in all honor and in the highest self-interest, take care that any inefficiencies inseparable from 'examination' are abundantly compensated by the extent and precision of your knowledge, and by the soundness and thoroughness of your whole education." Professor Attfield's views on education have always been of the broadest type. He has been a steady advocate of a curriculum of study, regarding the acquisition of knowledge merely for examination purposes as pernicious. Hence

he questioned any method of examining candidates which did not take note of the quality of the educational course which had been gone through. As a teacher he was pre-eminently kind and sympathetic; he made the instilling of knowledge secondary to the training of the innate powers of his pupils. One of these, Mr. J. A. Dewhurst, Ph.C., F.I.C., now Public Analyst of Halifax, Yorks, in a personal letter to the writer, thus speaks of his old Professor: "I am no hero-worshipper, but Professor Attfield has my real affection, born of a perhaps exceptionally intimate knowledge of him as teacher, employer and friend. As a teacher I found him unexpectedly considerate and courteous to an ordinary student. Whilst his assistant in connection with editorial work on the B P. and later in general analytical practice, I was impressed with his absolutely unvarying kindness. In his home, amidst his family, I was privileged to know him and found him still the same true gentleman. I count myself particularly happy in having known him, a living example which in my better moments I am content to emulate. Nor am I alone amongst his students in this—far from it." As a citizen Professor Attfield has taken an active part in the educational, sanitary, philanthropic, social and recreative movements in his native county. To a newspaper reporter he said not long ago: "I am an ardent patriot and politician, but cannot be a mere partisan. My vote, spare guineas and influence will always be at the disposal of the party that coquets least with incipient anarchy, neo-socialism and British disunion." It remains now only to refer to some of the honors which have been paid to Professor Attfield. In addition to the Fellowship of the Royal Society (1880), he is a Fellow of the Institute of Chemistry, and of the Chemical Society, and was for several years a member of the Councils of the two last-named bodies. He has enjoyed the rare and highly prized distinction of honorary membership of no less than twenty-three societies, associations and colleges of pharmacy in Europe, the British Colonies and America. He was President of the Hertfordshire Natural History Society in 1885–7. At present the only special monument in his honor is the Attfield Hall in the Chicago College of Pharmacy, where his portrait in oil is hung "in recognition of his aid in raising the College from its ashes in 1871 and of his unselfish devotion to the cause of education."

The writer is indebted for some of the facts here recorded to an

Plate XVI.

Main Entrance to the Royal Botanic Society's Gardens in Regent's Park.

earlier biographical sketch, written by Professor Attfield's old friend and colleague, Mr. Joseph Ince, F.L.S., author of the well-known "Latin Grammar of Pharmacy." The portrait of Professor Attfield which illustrates this sketch was taken in the autumn of 1905, shortly after his seventieth birthday.

LONDON BOTANIC GARDENS.

By Pierre Élie Félix Perrédès, B.Sc., F.L.S.,
Pharmaceutical Chemist.
A Contribution from the Wellcome Research Laboratories, London.

(*Continued from p. 76.*)

III.

THE ROYAL BOTANIC SOCIETY'S GARDENS, REGENT'S PARK.

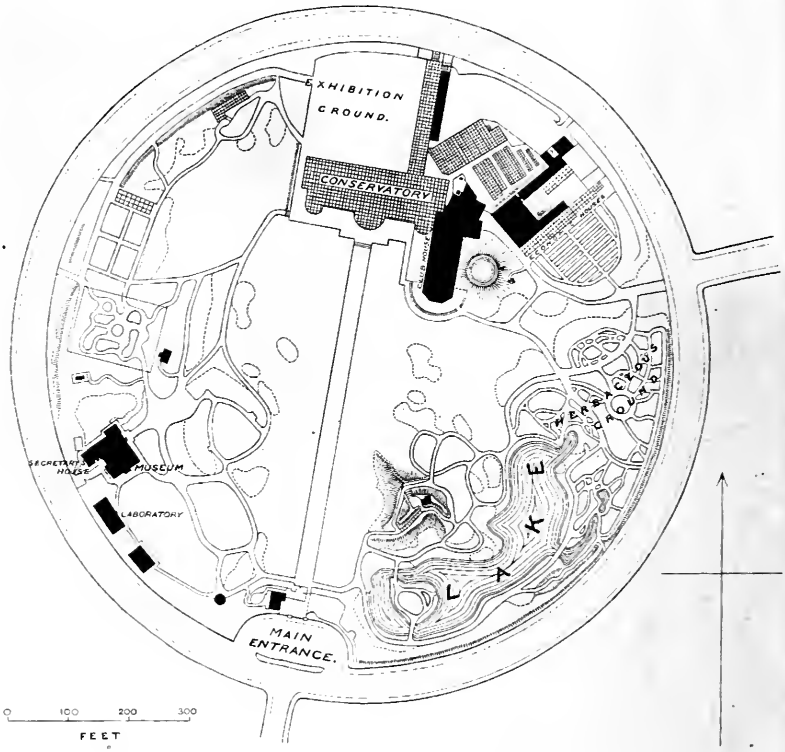
Regent's Park was opened in 1812, during the regency of the Prince of Wales, afterwards George IV, and named "Regent's Park" in his honor. The area now belted by a circular road known as the "Inner Circle," and consisting of over 18 acres of ground, was not included in the plan for laying out and planting the park, as it was the intention of the Prince Regent to erect a royal palace on that site. The project, however, was never put into execution, and, in 1838, we find that this plot of ground was occupied by a nursery garden, known as Jenkins' Nursery and Pleasure Ground. Towards the close of that year several influential people interested in botany approached Her late Majesty's commissioners with the object of obtaining a lease of Jenkins' Nursery from the Crown, for the purpose of converting it into a combined ornamental and botanic garden. Their quest was successful, and, in 1839, the Royal Botanic Society of London was permanently established, a Royal charter being granted to Bernard Edward, Duke of Norfolk; Charles, Duke of Richmond; William Charles, Earl of Albemarle; Lieutenant-Colonel Robert Rusbrooke; Philip Barnes (the originator of the scheme); and James de Carle Sowerby, "for the promotion of botany in all its branches, and its application to medicine, arts, and manufactures, and also for the formation of extensive botanical and ornamental gardens within the immediate vicinity of the metropolis."

The property, when taken over by the Society, consisted of "a nearly level plateau, only rising gently from the circumference to

the centre." The contents, bought from the nurseryman for £2,000, consisted of the following: A belt of elm trees of considerable size on the outer margin; an inner circle of small beeches; a group of trees on a lawn, where the secretary's house and museum now stand, and a few other trees scattered about; two old greenhouses; a cottage of wood and brick; some sheds; and general nursery stock.

One of the first steps taken by the Fellows of the Society was directed towards the accomplishment of the main purpose of their charter, namely, the conversion of the plot of ground they had acquired into a botanical and ornamental garden. With this object in view a prize was offered by the Society for the best plan submitted dealing with the laying out of the ground along these lines. The difficulties that the numerous competitors had to contend with, in constructing a plan for a garden that would combine the requisite scientific features with those of an ornamental ground, were so great, that, although the prize was awarded for one of the plans sent in, the latter was not considered sufficiently satisfactory for adoption in its entirety. It is to R. Marnock, who was appointed Curator on the recommendation of J. C. Loudon, the well-known horticulturist, that the Society is indebted for the very effective arrangement of its gardens, and it is indeed difficult to realize that their diversified landscape has been artificially evolved from a nearly flat piece of market garden.

The soil which Marnock had to deal with was the rather uninviting London clay, a stiff clay sprinkled with coarse gravel, the latter becoming more abundant a little to the south of Regent's Park; this clay, however, by reason of its impermeability, was well adapted to the first operation that was undertaken, namely, the formation of the Lake (see Plates XVII and XVIII). The material removed for this purpose was utilized in constructing the mound which divides the Lake from the main walk (see Plate XVII for this and other details described below). The north of the gardens was next attacked and the terrace constructed. On the southern portion of this terrace the principal portion of the Conservatory was erected in 1845, the wings being added later, the east wing in 1870, the west wing in 1875, by private subscription among the Fellows. This conservatory was the first iron and glass house of considerable size erected in England, while its heating arrangements were also a novel feature at the time. The hot-water pipes are placed under-



ROYAL BOTANIC SOCIETY'S GARDENS
REGENT'S PARK.

PLAN OF THE ROYAL BOTANIC SOCIETY'S GARDENS.
NOTE.—*The plant houses are indicated by crossed lines, and the other buildings by black areas.*

ground instead of being above the surface, as is usually the case; this arrangement presents a neat appearance, but it is rather wasteful. The east wing of the Conservatory is partitioned off as a tropical house, the main body of the building being heated to an intermediate temperature (between 50° and 60° F. in winter). The northern portion of the terrace, situated at the back of the Conservatory, was converted into an exhibition ground, new features being introduced into the arrangement of this also, in that sloping grass banks were substituted for the conventional tables under tents, and the whole was covered over with one spread of canvas. This system, however, has now been abandoned, and the customary method reverted to.

An arboretum was included in the original laying out of the gardens, but, owing to the limited space available, it has been reduced; there are, nevertheless, many handsome and interesting trees, including some fine willows. On the west, a Spring Garden, an American Garden, a Rose Garden, an Italian Garden, and an agricultural department were formed. These have been suppressed with the exception of the American Garden, which has preserved its initial arrangement, albeit it is now devoted to a show of rhododendrons, exhibited during the spring and summer months. Immediately to the north of this a horticultural ground has been laid out for the use of the students of the recently established horticultural school of the Society.

The portion of the gardens which possesses most interest for us is situated on the northeast, where the Economic Department is located, and on the east, near the upper end of the lake, where the Herbaceous Ground is to be found. The economic section proper, which has always received special attention at the hands of the Society, consists of a collection of trees and shrubs, and of a range of three lean-to houses maintained at three different temperatures, the central one, or stove, being heated to 65°—70° F., and the end ones to 60°—65° F. and 45°—50° F. respectively. The economic garden formerly comprised a central portion for the reception of hardy herbaceous plants, and an outer portion surrounding it, in which economic trees and shrubs were grown, but the contents of the former have now been merged into the general herbaceous collection. In the Herbaceous Ground, which is especially rich in medicinal plants, the original arrangement of the plants has been

adhered to, and is of special interest because it also originated with Marnock. Obvious as its advantages are, it only appears to have been adopted in one other garden in the kingdom, this being at the Cambridge Botanic Garden, where the energetic curator, Mr. R. Irwin Lynch, has made use of it to the greatest advantage. The beds are of different shapes and sizes, and are so laid out that each bed accommodates the plants belonging to one natural order. By this means the relative magnitudes of the various orders are shown at a glance. Closely related natural orders, furthermore, are grouped together, so that their relationships, as well as their respective importance in numbers, are indicated. In the centre of the Herbaceous Ground there is an enclosure containing a set of meteorological instruments, including a series of earth thermometers from a depth of 3 inches to one of 16 feet below the surface of the ground. Records of these readings are made three times a day, and the most important of these are printed in the society's "Quarterly Record."

The following is a list of the more interesting medicinal plants grown out of doors; some of them are to be found in the section especially devoted to economic plants, but the largest number is in the Herbaceous Ground:

Abies balsamea, Mill.; *Achillea Millefolium*, L.; *Aconitum Napellus*, L.; *Acorus Calamus*, L., or Sweet Flag; *Alkanna tinctoria*, Tausch., from which Alkanet root is obtained; *Althæa officinalis*, L., the Marshmallow; *Anthemis nobilis*, L.; *Artemisia Absinthium*, L.; *Arundo Donax*, L., the "*Canne de Provence*" of the French Codex; *Atropa Belladonna*, L.; *Carthamus tinctorius*, L.; *Chrysanthemum Parthenium*, Bernh.; *Colchicum autumnale*, L.; *Crocus sativus*, L.; *Cytisus Scoparius*, Link.; *Daphne Laureola*, L., and *D. Mezereum*, L., two of the three species of *Daphne* yielding the Mezereon Bark of the British Pharmacopœia; *Datura Stramonium*, L.; *Delphinium Staphisagria*, L; *Digitalis purpurea*, L.; *Ecballium Elaterium*, A. Rich, the Squirting Cucumber, from which Elaterin is prepared; *Eupatorium perfoliatum*, L.; *Ferula Narthex*, Boiss., and other species of *Ferula* yielding gum-resins; *Ferula Sumbul*, Hook. f.; *Fœniculum capillaceum*, Gilib.; *Fraxinus Ornus*, L., the Manna Ash; *Gentiana lutea*, L., from which the official Gentian Root is obtained; *Glycyrrhiza glabra*, L, or Liquorice; *Inula Helenium*, L.; *Iris Florentina*, L., and other species yielding fragrant rhizomes; *Juniperus Sabina*, L.; *Laurus nobilis*, L.; *Linum usitatissimum*, L.; *Mandragora officinarum*, L.; *Melissa officinalis*, L., or Balm; *Melilotus officinalis*, Lam., or Melilot; *Mentha piperita*, L., the Peppermint, and *M. Pulegium*, L., or Pennyroyal; *Menyanthes trifoliata*, L, or Bog bean; *Nicotiana Tabacum*, L.; *Papaver somniferum*, L.; *Peucedanum graveolens*, Benth.; *Phytolacca decandra*, L., the source of Poke root; *Polygonum Bistorta*, L., or Bistort; *Polypodium vulgare*, L., whose rhizome is official in the French Codex; *Pulmonaria offici-*

GENTIANA LUTEA, L.,
Growing in the Royal Botanic Society's Gardens.

VERATRUM VIRIDE. SOLAND.,
Growing in the Royal Botanic Society's Gardens.

nalis, L., or Lungwort, whose leaves, still retained in the Codex, are a relic of the old doctrine of signatures ; *Quercus pedunculata*, Ehrh., and *Q. Suber*, L.; *Rhamnus catharticus*, L.; *Rheum officinale*, Baill., and *R. palmatum*, L., var. *tanguticum*, sources of Chinese Rhubarb ; *Rosmarinus officinalis*, L., or Rosemary ; *Ruta graveolens*, L., or Rue ; *Rubia tinctorum*, L., Madder ; *Sambucus nigra*, L.; *Sanguinaria Canadensis*, L ; *Solanum Dulcamara*, L. ; *Tanacetum vulgare*, L. ; *Taraxacum officinale*, Weber ; *Trigonella Fœnum-græcum*, L., or Fenugreek ; *Tussilago Farfara*, L.; *Valeriana officinalis*, L.; *Veratrum viride*, Soland.; and *Verbascum Thapsus*, L., or Mullein.

The range of Economic Houses was first erected in 1873, under the secretaryship of Mr. W. Sowerby. It was entirely rebuilt last year (1904), and although several plants were lost owing to the severe weather that occurred while the work was being proceeded with these are being rapidly replaced. The following is a list of some of the more interesting plants, from the pharmacist's point of view, growing in these houses at the present time ; they are being added to every day, and the collection, which is already the most complete one of living exotic economic plants in London, will be, before long, a thoroughly representative one :—

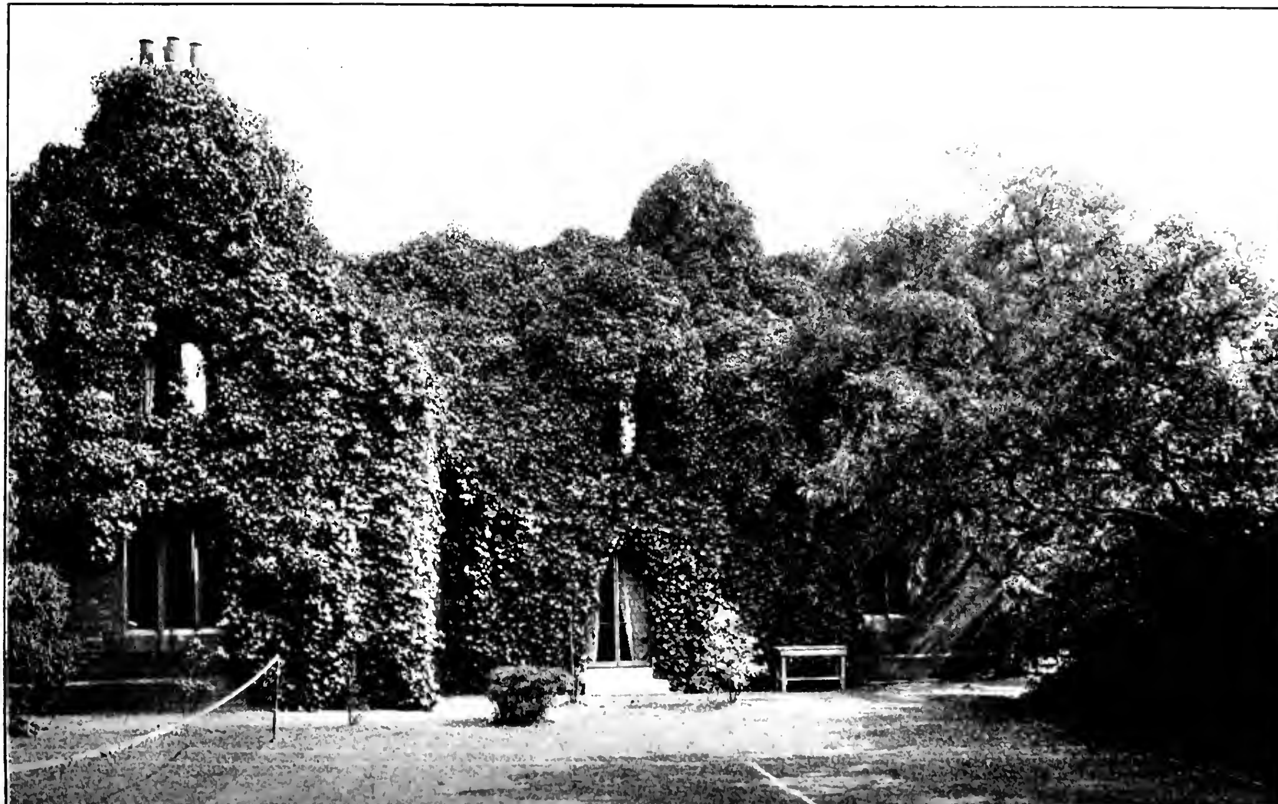
Aloe vera, L., and other species of Aloe ; *Areca Catechu*, L.; *Balsamodendron Myrrha*, Nees ; *Bixa Orellana*, L.; *Cæsalpinia Sappan*, L., whose heart-wood is official in the Colonial and Indian Addendum of the British Pharmacopœia, under the name of "Sappan ;" *Canella alba*, Murr.; *Castilloa elastica*, Cerv., source of Central American rubber ; *Chondodendron tomentosum*, R. & P., the source of true Pareira Brava; *Cinchona officinalis*, L., and other Cinchonas yielding medicinal barks ; *Cinnamonum Camphora*, Nees ; *Convolvulus Scammonia*, L., source of Scammony root, Scammony, and Scammony resin ; *Croton Eluteria*, Benn., from which Cascarilla bark is obtained, and *C. Tiglium*, L.; *Curcuma longa*, L.; *Dipteryx odorata*, Willd., the plant which yields Tonka beans ; *Drymis Winteri*, Forst., the source of true Winter's bark ; *Eucalyptus globulus*, Labill., and other species of *Eucalyptus ; Euphorbia resinifera*, Berg ; *Ficus elastica*, Roxb., from which East Indian rubber is obtained ; *Gossypium herbaceum*, L., and other species of *Gossypium ; Gynocardia odorata*, R. Br., formerly supposed to be the source of Chaulmoogra seeds and oil ; *Hevea Braziliensis*, Muell., from which Para rubber is obtained ; *Illicium verum*, Hook. f.; *Landolphia gummifera*, Lam., the source of Madagascar rubber ; *Musa sapientum*, L., and var. *Paradisiaca ; Nicotiana Tabacum*, L.; *Nopalea coccinellifera*, Salm-Dyck ; *Opoponax Chironium*, Koch. ; *Peumus Boldus*, Molina ; *Piper angustifolium*, L., *P. Betle*, L., *P. Cubeba*, L., and *P. longum*, L.; *Pogostemon Patchouli*, Pellet., the essential oil of which is used in perfumery ; *Ricinus communis*, L., *Santalum album*, L.; *Smilax officinalis*, Kunth, the reputed source of Caracas Sarsaparilla ; *Strychnos Nux-vomica*, L.; *Styrax Benzoin*, Dry.; *Terminalia sp.*, yielding Myrabolans ; and *Urginea maritima*, Baker.

The conservatory is chiefly used for the display of ornamental plants, but it also includes a few that are of medicinal interest, such as various species of *Aloe; Cereus grandiflorus*, Mill.; *Illicium verum*, Hook. f.; *Peumus Boldus*, Molina; several of the rubber-yielding plants; various *Eucalypti; Nopalea coccinellifera*, Salm-Dyck; *Musa sapientum*, L., and varieties, etc. In connection with the last-named genus, it is of interest to note that it was from a plant grown in this conservatory that the late Queen Victoria tasted the banana for the first time. At the rear of the conservatory, to the east, there is a glass corridor flanking the exhibition ground on the east, and leading out to the gate at the north end of the gardens; this is used for educational and other exhibitions from time to time. It is ornamented with creepers up the sides and roof, and with a row of camellias on each side, which can be removed while exhibitions are being held—otherwise it is unoccupied.

In addition to the economic houses and conservatory, and situated between them, there are houses for the accommodation of filmy ferns, succulents, ferns, orchids, etc., and a large Victoria Regia House, opening into the corridor of the conservatory. These, with the exception of the succulent house, contain no plants of medicinal interest, and there is nothing in the last-named which is not equally well represented in the Economic Houses. Other adjuncts of this section of the gardens are propagating houses and frames, a plant hospital, potting sheds, etc.

The secretary's house, and the adjoining museum, which is also used as a council-room and as a fellows' meeting-room, was erected in 1851 to take the place of the cottage of wood and brick mentioned above. The specimens in the museum were at first entirely educational in character; these have been retained and added to, and comprise an interesting series, illustrating the natural history of plants. In the course of time, however, this special collection has developed into a general botanic and economic one; it comprises a goodly collection of drugs, including a series of the different varieties of aloes, tea and india-rubber, and a sample from the first consignment of gutta-percha brought into this country; the collection of gums and gum-resins is an extensive one, as is also that of vegetable oils and fats. Of secondary interest to us are the collections of tropical fruits and vegetables, of woods and dyes, and those of tanning materials, fibres and fibre-plants and cereals. In addition

Plate XXI.



to the specimens themselves, there is, in the museum, a valuable collection of oil paintings of plants and flowers by the Hon. Evelyn Ellis.

The Laboratory was built in 1902, in connection with the Gardening School. It is fitted up with benches, gas and water being laid on, and is also adapted for use as a lecture hall.

THE WORKING OF THE GARDENS.

The management of the Society's affairs, including the Gardens, is in the hands of a Council elected by vote of the Fellows. A president is also elected yearly, but, up to the present, every president has been re-elected until his death. The first president was Charles, Duke of Richmond (to 1842); the second, Bernard Edward, Duke of Norfolk (to 1856); the third, the late Prince Consort (to 1862); the fourth, Lord de La Warr (to 1869); the fifth, the Duke of Teck (to 1898); and the sixth, his son, the present Duke of Teck, who still occupies the position. The Society has, moreover, always enjoyed distinguished patronage; the late Queen Victoria was its patron from the beginning, until her death, and the Duchess of Kent and the Duke and Duchess of Cambridge the first vice-patrons. King Edward is the present patron and Queen Alexandra, patroness, while the Prince and Princess of Wales are vice-patron and vice-patroness respectively.

The principal officer of the Society is the Secretary. J. de Carle Sowerby, one of the founders, was the first to hold office in this capacity, and this post has since been occupied by members of the same family, the present Secretary being Mr. J. Bryant Sowerby, F.L.S.

The gardening staff is in charge of Mr. E. F. Hawes, who is likewise Chief Instructor of the Practical Gardening School. There is also a Curator attached to the Museum.

The Society, depending entirely as it does upon the Fellows' subscriptions for its funds, has found it necessary to effect a compromise in the organization of its functions, especially in view of the fact that the renewal of the lease of the Gardens from the Crown, in 1901, was only secured by paying a higher price than before. The inducement required to attract a larger number of Fellows has been provided by the introduction of a number of features for their comfort and amusement, such as a croquet and tennis ground, suitable

accommodations for garden fêtes, frequent displays of flowers and decorative plants, and a club house.

It is, however, in its educational capacity that the Society claims our attention, for in so far as medical and pharmaceutical students are concerned, it undoubtedly fulfils the chief rôle in London in supplying the necessary materials for the study of living plants. Close upon seven hundred students' tickets are issued annually through the medium of the professors and teachers in the respective schools, these tickets being available daily, until 3 o'clock in the afternoon; after that hour the Gardens are reserved for the use of the Fellows and visitors. In addition to this, from 50,000 to 60,000 cut specimens are distributed among such students every year. Lectures in Botany were formerly delivered on certain mornings in the Gardens to the students of the Pharmaceutical Society's School, but they have been discontinued for some years.

Among the educational features of the Society the lectures delivered from time to time on botanical subjects must be included; these, together with the other proceedings of the Society, are published in its "Quarterly Record."

In 1897 the educational side was further developed by the institution of a Practical Gardening School. The training consists of a course, extending over a period of three years, which is essentially practical in character, although it is accompanied by a series of lectures delivered in the Laboratory. The students consist, in part, of pupils who have obtained scholarships from the London School Board—now the Education Department of the London County Council. These, originally ten in number, acquitted themselves so satisfactorily that the number has since been increased to twenty. In addition to the scholars, there are several independent students, many of whom are ladies.

This account would not be complete without a concluding reference to the educational exhibitions that are occasionally held in the Gardens. These are illustrative of work done in schools on the too-long neglected subject of Nature Study, and must appeal to everyone who has the cause of education at heart.

[Further details concerning the Royal Botanic Society's Gardens will be found in the Society's "Quarterly Record," first published in 1880, and continued from that date to the present time. In vol. III of that publication (No. 36, p. 216. London, 1888) there is a short historical account of the Society contributed by

Mr. W. Sowerby, the Society's secretary at that time, on the occasion of the fiftieth anniversary of the Society. There is also an official Guide to the Gardens (London, 1900) which contains a number of interesting photographs of their characteristic features, in addition to an excellent popular account of the Gardens by Mrs. J. B. Sowerby. More recent developments still are briefly summarized in an illustrated booklet issued by the Council, and entitled "The Royal Botanic Society of London."]

(*To be continued.*)

ESTIMATION OF CASEINE.—A PRELIMINARY STUDY.[1]

By H. V. Arny, Ph.D., and T. M. Pratt, Ph.C.

The marked need for a simple and reliable estimation of caseine is apparent to all chemists doing milk analysis. The only direct volumetric process—that of Denigè (*Jour. Pharm. et Chem.*, Series 6, VII, No. 1) is too complicated for practical purposes; while the generally accepted method of nitrogen estimation by the Kjehldahl process, involving as it does digestion with sulphuric acid and mercury, distillation of this mixture with potassium sulphide and alkali and final titration of the distillate for ammonia with volumetric solution of sulphuric acid, and that only after separation of the lactalbumin and globulin, is even more intricate and time consuming.

Needing a quick process, one of us tried the simple expedient of noting the amount of potassa alum required for the complete precipitation of caseine from milk, and the results on rough estimations were so satisfactory and pointed so convincingly to the fact that alum combined with caseine in molecular proportions, that attempt was made to bring the process within a limit of reasonable accuracy.

The scheme consisted of slowly dropping alum solution from a burette into warm diluted milk, until precipitation was complete. Experience shows that uniform heat was essential for definite results, since cold milk requires more alum for precipitation than does warm. and that in proportion to heat employed.

The weakness of this process lay in the difficulty in deciding the point of complete precipitation. Yet, it is a striking fact that of 1,000 samples examined during two years, 694 required 2·9 to 3·1 c.c. concentrated alum solution for precipitation of 25 c.c. of milk, while

---

[1] Presented at the Atlantic City meeting of the American Pharmaceutical Association, September, 1905, and contributed by the authors.

the amount of solution for the entire 1,000 samples ranged only from 2·6 to 3·2 c.c. to 25 c.c. milk.

The writers have since found that Schlossman (*Ztschr. physiolog. Ch.*, vol. 22, p. 197) employed a concentrated alum solution for the separation of caseine from the other milk albuminoids; estimating the amount of caseines, however, by submitting the precipitation to the Kjehldahl process. It is interesting to note that he mentions that 1 to 1·5 c.c. concentrated alum solution is necessary for the complete precipitation of caseine from 10 c.c. milk, thus confirming the writers' figures on 25 c.c. milk, given above.

Finding the estimation satisfactory in principle, efforts were made toward greater accuracy. In using alum solution alone, the end of precipitation is obscured by a slight greasiness of the liquid and attempts were made to obviate this by addition of alkali, such as sodium carbonate, bicarbonate or borate. While these did aid in giving a clearer precipitation their use complicates final calculations and was abandoned.

The next efforts were toward proving the end of reaction by indications of alum in the whey, but work in this direction was hampered by lack of a delicate color reagent for alum. Decoction of logwood, suggested by Mrs. Richards ("Leffmann's Water Analysis," 1895, p. 59), gives a brilliant color test, but experiments proved that it was not sufficiently delicate for the dilution of alum found in the whey.

Failing to find a sensitive color test of potassa alum, attention was turned to ferric alum, experiments showing that both ferric and chrome alum precipitated caseine from milk with the same facility as does potassa alum.

The first plan was to add a decinormal ferric alum solution to diluted milk, filtering a few drops of the whey upon a crucible top and bringing in contact with the filtrate a drop of solution of potassium ferrocyanide or potassium sulphocyanate. The result of these experiments was far from satisfactory, it being found that the end of reaction was scarcely more sensitive in the high degree of dilution required than it was with alum and logwood decoction.

An interesting fact noted was that the filtrate did not respond to the iron test with the reagents until long after all the caseine had been precipitated; while on the other hand, when the ferrocyanide solution was first treated with acetic acid, the response was much

earlier. This phenomenon is evidently due to the fact that the albumin of the milk forms a soluble iron albuminate, which does not respond to ferrocyanide until decomposed by acid. This may eventually lead to a quick method of estimating total proteids of milk, but so far, results obtained have been too variable for practical use.

Failing along all these lines for results trial was made of precipitating milk with a definite excess of decinormal ferric alum solution, filtering off the precipitated caseine and estimating amount of ferric alum remaining in the filtrate by titration with potassium iodide, hydrochloric acid and decinormal sodium thiosulphate. The process at present employed is as follows: 20 c.c. decinormal ferric alum solution (48·1 grammes to the liter) is mixed with the desired amount of milk—5, 10, 20 or 30 c.c.—at ordinary temperature, some water added, the mixture shaken and allowed to stand a few minutes and then filtered, the precipitation being washed until the washings are free from iron. Either the whole filtrate or half of it is titrated with potassium iodide, acid and thiosulphate, and thus the amount of unused ferric alum is ascertained. The difference in the amount of ferric alum in the original solution and the amount used gives the quantity of ferric alum required for precipitation of caseine.

Figures on this work are here given:

TABLE I.

All samples treated with 20 c.c. decinormal ferric alum solution.

Milk sample.	Cubic centimetres milk used.	Cubic centimetres decinormal thiosulphate required.	Cubic centimetres decinormal ferric alum used for milk.
1 a	10	16·2	3·8
1 b	10	16·2	3·8
1 c	5	18·2	1·8
1 d	5	18·4	1·6
2 a	10	16·4	3·6
2 b	10	16·4	3·6
2 c	5	18·0	2·0
2 d	5	18·0	2·0
2 e	5	18·0	2·0
3 a	5	17·9	2·1
3 b	5	18·0	2·0
3 c	10	16·2	3·8
3 d	10	16·0	4·0
3 e	15	14·4	5·6
3 f	15	14·4	5·6
4 a	25	9·8	10·2

4 b	25	9·8	10·2
5 a	20	12·0	8·0
5 b	20	12·2	7·8
5 c	10	16·0	4·0
5 d	10	16·0	4·0
6 a	20	12·0	8·0
6 b	20	11·8	8·2
6 c	10	16·0	4·0
6 d	10	16·0	4·0
7 a	30	8·0	12·0
7 b	30	8·0	12·0
7 c	20	12·0	8·0
7 d	20	12·0	8·0
7 e	10	16·0	4·0
7 f	10	16·2	3·8
8 a	5	18·0	2·0
8 b	5	18·0	2·0
8 c	10	16·0	4·0
8 d	10	16·0	4·0
8 e	20	12·0	8·0
8 f	20	12·0	8·0
9 a	20	11·8	8·2
9 b	20	11·8	8·2
9 c	10	15·8	4·2
9 d	10	15·9	4·1
10 a	5	18·0	2·0
10 b	5	18·0	2·0
10 c	10	16·2	3·8
10 d	10	16·0	4·0
10 e	20	11·8	8·2
10 f	20	12·0	8·0

As shown by above figures the results are definite as to caseine content. It will be observed that the amount of ferric alum used for 5, 10, 20 or 30 c.c. is in direct proportion to these amounts, and that the variation on different samples of milk is no greater than would be expected of its varying caseine content.

The feasibility of the process depends on whether the other constituents of the milk, such as sugar and fat, enter into the reaction with ferric alum. The following experiments seem to show that such fears are groundless.

Filtrate from 10 c.c. milk, plus 20 c.c. ferric alum solution, required 16·2 c.c. decinormal thiosulphate solution. Filtrate from 10 c.c. same milk, plus 0·4 grammes milk-sugar (same amount as in original milk), required 16·2 c.c. decinormal thiosulphate solution.

Thus, in one sample of milk, there was twice as much sugar as in the other, and yet the amount of thiosulphate required was practically the same in both cases.

In connection with this, Long (*Jour. Am. Chem. Soc.*, Vol. XIX, p. 683) has published elaborate work, showing that sugar eventually reduces ferric salts to the ferrous state.

However, he notes that the change is first noted after standing forty-eight hours, and in the present process, the entire time from adding ferric alum to milk to the final titration, need not exceed six hours; hence the results given above in no way run counter to Dr. Long's statement.

As to influence of fat:

20 c.c. milk, plus 20 c.c. ferric alum solution required 12 c.c. thio. solution.
20 c.c. " " 20 c.c. " " " " 11.6 c.c. " "
20 c.c. " " 0·6 gm. butter, plus 20 c.c. ferric alum solution, required 11·6 c.c. thiosulphate solution.
20 c.c. milk, plus 0·6 gm. butter, plus 20 c.c. ferric alum solution, required 11·66 c.c. thiosulphate solution.

Thus, double the theoretical amount of fat does not affect the results. As already mentioned, the question of the temperature of the milk is of the greatest importance, and the figures of a large amount of preliminary work with ferric alum were rendered useless for this paper, because the mixture of milk and ferric alum were warmed before filtration. Later experiment showed that, unlike the precipitation of caseine with potassa alum, heat was not necessary to facilitate the filtration of whey and led to the variation in the figures obtained.

Heat affects the coagulation of ferric albuminate, while in cases of cold admixture it remains in solution or at most in soluble colloidal form. Thus, if the filtrate from a ferric alum precipitate is divided into two portions, and one-half is titrated just as it is while the other half is boiled and filtered, and the second filtrate titrated; the latter requires much less thiosulphate solution than the first half.

Time has prevented careful investigation of this important point within which possibly lies the germ of a volumetric estimation of total proteids in milk, even as does the cold process give us the amount of caseine.

It will be noticed that with practically all samples of milk reported in Table I, 10 c.c. milk required 4 c.c. decinormal ferric alum solu-

tion (0·1924 gramme ferric alum) for precipitation of caseine. This factor is, however, insufficient as a standard of milk-testing, and therefore a line of comparative tests between amount of ferric alum consumed and amount of nitrogen in the caseine by the Kjehldahl process was instituted.

In this line of experiments, 20 c.c. decinormal ferric alum solution was placed in a Kjehldahl distilling flask and 10 c.c. milk and about 20 c.c. water added. The precipitate was transferred to a filter, washed free from soluble iron and the filtrate titrated with decinormal thiosulphate solution. The precipitate and filter was dried, placed in the original dried Kjehldahl flask to the walls of which some of the precipitate still remained clinging. The contents of the flask were then digested with sulphuric acid and mercury, distilled with potassium sulphide and alkali and the liberated ammonia was titrated with decinormal sulphuric acid. Blank experiments, including filter-paper, were carried on at the same time and correction made in the caseine estimation. The results are shown in the table appended:

TABLE II.

In all 10 c.c. milk was mixed with 20 c.c. decinormal ferric alum solution, the filtrate titrated with decinormal sodium thiosulphate solution, while the precipitate was assayed for nitrogen by the Kjehldahl process. In the columns marked "Percentage Caseine" "a" gives the figures obtained by multiplying weight of nitrogen by 6·25 x 10, while "b" gives results in using factor 6·38 x 10.

	Filtrate.		Precipitate.			
Milk sample.	Cubic centimeters decinormal thiosulphate requ'd.	Cubic centimeters decinormal ferric alum used by milk.	Cubic centimeters decinormal sulphuric acid needed.	Am't of nitrogen in grammes.	Percentage caseine. a	b
1 a	15·8	4·2	25·5	0·0357	2·23	2·28
1 b	16·0	4·0	25·0	0·0350	2·19	2·23
1 c	16·0	4·0	26·0	0·0364	2 27	2·33
2 a	16·1	3·9	24·0	0·0336	2·10	2·14
2 b	16·	4·0	23·0	0·0322	2·01	2·05
2 c	16·	4·0	24·0	0·0336	2·10	2·14
2 d	15·9	4·1	23·5	0·0329	2·05	2·10
3 a	16·4	3·6	26·0	0·0364	2·27	2·33
3 b	16·0	4·0	26·6	0·0372	2·32	2·37
3 c	16·0	4·0	26·5	0·0371	2·32	2·36
3 d	16·2	3·8	26·0	0·0364	2·27	2·33
4 a	15·9	4·1	24·5	0·0343	2·14	2·19

4 b	16·0	4·0	25·0	0·0350	2·19	2·23
4 c	15·9	4·1	25·5	0·0357	2·23	2·27
4 d	15·8	4·2	26·0	0·0364	2·27	2·33
5 a	16·0	4·0	25·3	0·0354	2·20	2·25
5 b	15·8	4·2	25·0	0·0350	2·19	2·23
5 c	15·8	4·2	25·9	0·0362	2·26	2·31
5 d	15·6	4·4	25·5	0·0357	2·23	2·28
6 a	15·7	4·3	24·5	0·0343	2·14	2·19
6 b	15·9	4·1	25·0	0·0350	2·19	2·23
6 c	16·2	3·8	24·3	0·0340	2·12	2·17
6 d	15·8	4·2	25·5	0·0357	2·23	2·27

To establish the definite standard, it will of course be necessary to make a large number of comparative estimations, and that with officially standardized measures instead of ordinary laboratory glassware. Such work will be performed by the writers during the coming winter, and it is hoped that other investigators will take up the same line of experiments; for if the ferric alum estimation is entirely feasible, it will prove vastly superior to the cumbersome and tedious Kjehldahl process now in vogue.

In conclusion, a few remarks as to methods of manipulation may be in place. The most convenient amount of reacting ingredients is 10 c.c. milk and 20 c.c. decinormal ferric alum solution (48·1 gramme to the liter). This amount of ferric alum solution requires exactly 20 c.c. decinormal thiosulphate solution to decolorize the iodine liberated by it and the acid from the potassium iodide, and each cubic centimeter of thiosulphate solution less than twenty, required after combination with milk, means a cubic centimeter of ferric alum solution employed in precipitation.

The milk and ferric alum solution are mixed cold and it seems to make but little difference whether the milk be added to the ferric alum solution or vice versa. The mixture is allowed to stand fifteen or thirty minutes and then filtered, and for this purpose a pledget of cotton in a glass funnel is found most satisfactory. If filter paper is used the iron creeps to the edge of the paper, from which it is washed with much difficulty. Pressure filtration was tried—to quicken process—but with results scarcely as satisfactory as filtration through cotton. At its best, the process of filtration is tedious, yet we have washed out precipitates in two hours and a batch started in the afternoon can always be ready for titration the next morning.

In filtering, best results are obtained by throwing precipitate on filter in fairly concentrated liquid: that is, the total fluid need not

measure more than 50 c.c. The distilled water used for washing the precipitate should be added before all of the preceding liquid has run through; for the drained precipitate becomes a firm mass through which liquid passes with difficulty. The filtrate is usually free from iron when it measures 200 c.c. (at times it is iron free when 150 c.c. have passed through), and either the total filtrate or an aliquot part can be titrated with thiosulphate solution. The titration is carried on as provided in the assay of ferric alum given in U.S.P., 1900.

In passing it might be noted that the strength of ferric alum and thiosulphate solutions used in this work are based on the molecular weights of the U.S.P., 1890, since experiments were started before the appearance of our present standard.

In filtration, care must be taken that the liquid as it drops from the funnel is clear and if it is cloudy it must be returned until it does drop clear. Shortly after the filtration the liquid becomes slightly turbid, due undoubtedly to separated ferric albuminate. It was feared that the precipitate might be caseine instead of ferric albuminate and thus prove a source of error. That there was little danger of this, provided the filtrate was originally clear, seemed shown by the uniformity of figures in Tables I and II, but to settle the question, six samples of the same milk,—a, b, c, d, e, and f—were assayed. One set—a, c, and e—the originally cloudy liquid was refiltered before titration; while their duplicates, b, d, and f, were titrated in cloudy condition, with the following results:

TABLE III.

All with 20 cubic centimeters decinormal ferric alum solution.

Milk sample.	Amount milk used.	Cubic centimeters decinormal thiosulphate required.	Cubic centimeters decinormal ferric alum used by milk.
a	5 c.c.	18	2·0
b	5 c.c.	18	2·0
c	10 c.c.	16	4·0
d	10 c.c.	16	4·0
e	20 c.c.	12	8·0
f	20 c.c.	12	8·0

As the results of titration in both cases were identical, the amount of separated substance must be insignificant.

PHARMACEUTICAL LABORATORY,

CLEVELAND SCHOOL OF PHARMACY.

August, 1905.

PROGRESS IN PHARMACY.

A REVIEW OF SOME OF THE MORE INTERESTING LITERATURE RELATING TO PHARMACY AND MATERIA MEDICA.

By M. I. Wilbert,
Apothecary at the German Hospital, Philadelphia.

In this country the interest in matters pharmaceutic appears to be about evenly divided between the pending warfare on nostrums and fraudulent proprietaries and current criticisms on the recently issued revision of the U.S.P.

American pharmacists, and particularly the editors and owners of American pharmaceutical and drug journals, have not taken the prominent part in the present efforts to eliminate charlatanry and fraud from the practice of pharmacy that might, very properly, have been expected. This is all the more unfortunate in that pharmacists, as a class, should, above all others, be cognizant of the very grave possibilities for harm that are embodied in the several nostrums that are daily advertised and sold to the laity.

If the pharmacist of to-day has any possible excuse for his existence it is in this that he is supposed to be capable of differentiating the good from the bad, in medicine, and is thus in a position to point out to his customers, or to physicians, the shortcomings and the faults of supposedly new remedies or popular panaceas.

If then the pharmacist fails to take advantage of any or all opportunities that are offered him to make public his knowledge regarding the proper status of these several preparations, or, even worse, if he should fail to properly acquaint himself in regard to the truth or the falsity of the various claims and statements that are made regarding them, he is distinctly negligent in fulfilling his evident duties to himself and to the community and is certainly not deserving of the confidence and the patronage for which he is making a bid.

That harmful and fraudulent nostrums are being advertised and sold is admitted by all who have given the matter even cursory attention. It, therefore, appears to be particularly unfortunate that even a limited number of the pharmaceutical and drug journals of this country have been so remiss in appreciating the evident necessity of the hour as to not alone ignore the questions really at issue, but, even worse, to condone the shortcomings and the faults of some of these evidently fraudulent nostrums, because the proprietors or their

agents are supposed to have made sundry concessions to better the financial prospects of the retail pharmacist, whereas, in reality, these supposed concessions have been made, practically under compulsion, in a frantic endeavor to protect the nostrums themselves.

Proprietary Medicine Label Bills.—The most evident as well as the most direct outcome of the present attacks on fraudulent nostrums is to be found in the proprietary medicine label bills, similar to the one enacted in North Dakota last year, that have been introduced in a number of State Legislatures. A bill of this nature, that has been introduced into the Legislature of the State of New York, is said to have the endorsement of a number of prominent citizens of New York City as well as other sections of the State.

This proposed New York law requires that proprietary or patent medicines containing alcohol or any hypnotic, anesthetic, analgesic or cardiac, circulatory, respiratory or nerve depressant, have plainly displayed a true statement of the percentage of alcohol and the proportion of active drugs that would properly come under any one of the specified headings.

This same bill further provides for the analyses of suspicious preparations, and also provides a series of penalties for the violation of any or all of the provisions of the proposed law.

The Formula Bill proposed by Mr. Bok, in the February number of *The Ladies' Home Journal*, is much more drastic in character and provides that the label of all of the so-called patent medicines shall contain, in letters of a specified size, a complete and true schedule of all of the ingredients and their exact proportions.

That considerable legislation along these lines may be expected in the course of the next year or two is evidenced by the attitude that has been assumed by the members of the Proprietary Association of America, who, at their semi-annual meeting, in New York, last December, resolved that their legislative committee be instructed "to advocate legislation which shall prevent the use of alcohol in proprietary medicines for internal use, in excess of the amount necessary as a solvent and preservative." The legislative committee was further instructed to continue their efforts in behalf of legislation to restrict and to control the sale of cocaine and of other narcotics and poisons or medicinal preparations containing the same.

With the manufacturers of proprietary medicines themselves arrayed in favor of this particular type of legislation it would be

surprising indeed if the annual crop of formula bills did not exceed all previous records and if some of them, at least, were not enacted into laws.

The sale of intoxicating proprietaries is being rapidly restricted under existing laws, and it is quite probable that after April the 1st, when the previously announced ruling of the Commissioner of Internal Revenue, Mr. Yerkes, finally goes into effect, many if not all of the States will have made provision for further restricting the sale of such preparations. The liquor license laws of a number of States will probably require that pharmacists who desire to sell proprietary medicines that have been classed as being alcoholic, must secure not alone a United States license, but also a State, county and city permit or license. Action along these lines has even now been taken by the States of New York, Ohio, Missouri, Arkansas and Georgia.

The Council on Pharmacy and Chemistry of the American Medical Association is attracting considerable attention on the part of medical societies, in various sections of the country. Quite a number of local or county societies have endorsed the work that has been outlined for the council, and have further requested their individual members to favor publicity and honesty in all that pertains to medicines and medicinal preparations.

American Medicine for Honesty in Pharmacy.—By far the most encouraging sign of the times is the action that was taken by the stockholders of *American Medicine* at the recent annual meeting; in instructing the management of the journal to adopt, so soon as possible, a standard for advertising "as high as that of the Council on Pharmacy and Chemistry of the American Medical Association," and to reject any and all advertising which shall not come up to the adopted standard. (*Am. Med.*, February 17th, page 224.)

This action on the part of the stocholders of this particular journal is all the more important in that every holder was necessarily aware of the fact that such action would certainly entail serious personal loss, and might possibly involve the very existence of the journal itself.

Prescribing of Proprietaries.—From an editorial in the *American Druggist* (February 12, 1906, page 59) we would be led to believe that, contrary to all reasonable expectations, the crusade of the American Medical Association against objectionable proprietary

compounds has actually resulted in a marked increase in the use of these preparations by physicians during the past year.

The results of the canvass made by the *American Druggist* may be misleading, however, in that the conclusions were arrived at prematurely. At all events, it will be safe to withhold our final decision until after the present efforts have been given a reasonable time in which to demonstrate their efficiency or lack of efficiency.

Popularizing the Pharmacopœia with Physicians.—It has been repeatedly asserted that much of the present-day popularity of proprietary medicines is directly due to the fact that physicians have little or no knowledge of the Pharmacopœia and its contents, and that no consistent attempt has ever been made to bring the various drugs and preparations of the Pharmacopœia prominently before the medical practitioners of the country.

This shortcoming is being guarded against, in a measure, at the present time, and a number of ways and means of popularizing the recent revision of the Pharmacopœia are being tried. Not the least pretentious of these is the plan that has been adopted by the *Journal of the American Medical Association* in its current numbers. This journal is now printing a series of special articles designated "The Physician and the Pharmacopœia" that are designed to arouse the interest of medical practitioners in the various uses of the several official substances and preparations and incidentally at least to point out the advisability of adhering more closely to pharmacopœial preparations.

Pharmacists, if they were so inclined, could readily take advantage of this series of articles, and by bringing them more directly to the attention of physicians in their immediate neighborhood, or by demonstrating the elegance or desirability of pharmacopœial or N.F. preparations, would probably be able to convince a number of physicians that there is in reality absolutely no need for the present widespread use of proprietary remedies, particularly simple mixtures.

Another very promising plan for popularizing official preparations is that adopted by the druggists of Dallas, Tex., who, under the very able leadership of Prof. E. G. Eberle, have induced local physicians to meet and listen to descriptions or talks on the new Pharmacopœia and its contents. There are so many reasons to advance in favor of a more strict adherence to well-known or widely used reme-

dies that even a simple enumeration of them would be too extensive to attempt at this time; the single matter of international standards alone should prove to offer strong argument.

The advantages that must necessarily accrue from the now generally adopted standards for potent medicaments should necessarily appeal to every reader of medical journals, and a physician who does not read medical journals is, of course, absolutely hopeless. This is all the more evident when we remember that despite their general antiquity the potent remedies that were endorsed by the International Conference at Brussels in 1902 are in reality the most widely used as well as the most generally reliable medicaments now available.

It should not be forgotten, of course, that many pharmacists have already done good service in this connection by bringing the changes in the present edition of the U.S.P. to the attention of physicians, but, this is only a feeble beginning and unless it is followed up frequently and persistently by word of mouth and by actual demonstration it will be of little avail.

With a view of bringing the U.S.P. more directly to the attention of medical students the Board of Trustees of the Committee on Revision have decided to present the professors of materia medica in medical colleges with complimentary copies of that book. This seemingly trivial outlay should be of great value to American pharmacy, as it will, no doubt, tend to familiarize future generations of medical men with the fact that such a book as a Pharmacopœia of the United States actually exists, that it is periodically revised, and that, all in all, it may safely be considered as the standard for reliable and efficient medication.

Spanish Edition of the U.S.P.—This desirable innovation was also definitely decided on at the meeting of the Board of Trustees of the U.S.P., held in Pittsburg, December 2, 1905. A committee consisting of Prof. J. P. Remington, Chas. E. Dohme and Dr. H. C. Wood, was appointed to make preliminary arrangements for an edition of 2,000 copies. Of the foreign pharmacopœias that are now undergoing revision the French Codex and the Swiss Pharmacopœia are announced as being in press, and will probably be issued in the course of the next year.

The New Spanish Pharmacopœia.—A recently published review of the Spanish Pharmacopœia (*Phar. Zeit'g.*, 1905, page 1060) con-

tains some additional information of interest in connection with this book. The Pharmacopœia itself is said to contain 1080 separate titles, and is printed entirely in the Spanish language, with the exception of the subtitles, which are in Latin.

The metric system of weights and measures is used exclusively for the first time. The descriptions of a number of alkaloidal drugs contain minimum requirements for alkaloidal content but no detailed descriptions of assay are appended. Wherever practicable chemical formulæ with molecular weights are also included, the atomic weights being based on o = 16.

The Spanish Pharmacopœia includes suggestions on the therapeutic action and uses of drugs, also an enumeration of doses.

Among the tables found in this pharmacopœia is one enumerating the comparative size of drops of various galenicals, delivered from the proposed international standard dropper having an outer diameter of 3 mm.

The recommendations of the International Conference for the Unification of the Formulæ of Potent Medicaments have been generally closely followed and the Spanish Pharmacopœia is therefore the first to officially recognize these proposed standards in Europe.

Of the new remedies the Spanish Pharmacopœia includes, among others, antipyrin, aristol, betol, bromoform, creolin, cresylol, dermatol, digitalin, diuretin, diastase, euchinin, exalgin, euphorin, guaiacol, guaiacol carbonate, ichthyol, iodol, naphthol, peptone, sulfonal, trional, urethrane, and xeroform.

The Spanish apothecary has been shown the consideration of being expected to have a high degree of efficiency, for while the requirements for purity of the several substances are high the details for determining the purity of these substances are left to the choice of the operator.

Austrian Pharmacopœia.—The eighth edition of the Austrian Pharmacopœia has finally been published and it is announced that it is to become official on and after July 1, 1906.

This new, eighth, edition of the Austrian Pharmacopœia contains 627 official articles, or, if we add the fifty-four articles contained in the appendix and the nine descriptions of surgical dressings, it contains a total of 690 titles.

Among other novel features that are embodied in this edition of the Austrian Pharmacopœia we find directions for sterilizing various

solutions and it is expected that, in future, all solutions that are intended for intravenous or for hypodermic injections are to be dispensed in a sterile form only. Another innovation is to be found in the fact that distilled water only is recognized as being fit for use in making galenical preparations and all of the official formulæ specify that form of water.

The provisions of the International Congress for the unification of the formulæ for potent medicaments are generally closely adhered to and the revision committee has also adopted the proposed international standard dropper.

Narcotic extracts and tinctures are to be assayed and a specified alkaloid content is provided for. Other tinctures and fluid extracts are expected to conform to certain requirements or standards for specific gravity and extractive.

The Austrian Pharmacopœia, in keeping with other recently issued European pharmacopœias, has recognized the necessity for describing powdered drugs, but is probably the first to add requirements for content of extractive and a limit for residual ash in addition to the generally described microscopic structure.

As was to have been expected, the chemistry of the Austrian Pharmacopœia is quite modern. The composition of the various substances and all of the tests are based on atomic weights of the elements corresponding to $O = 16$, in place of $O = 15{\cdot}96$, as formerly official in this and other pharmacopœias. (*Phar. Post*, Jan., 1906, page 53.)

The New French Codex.—M. Bourquelot, the head pharmacist of the Laennec Hospital, Paris, and the secretary of the Codex Revision Committee, in an interview recently accorded to a correspondent of the *Chemist and Druggist* (Jan. 27, 1906, page 133), gave publicity to a number of interesting facts regarding the new Codex which is now in press.

The cumbersome arrangement of former editions will be dispensed with and a strictly alphabetic arrangement is to be adopted in its stead. The now official articles that have been dismissed are numerous, upwards of 900. The new additions will number in the neighborhood of 150 and will include many of the newer remedies, serums, and also at least several fluid extracts.

The international formulæ have been adopted in their entirety and with the exception of three, or at most four, formulæ will be

adopted as the national standards, while the remaining will be included in an appendix at the end of the book.

The Bulletin of the A.Ph.A.—The initial number of the *Bulletin* of the American Pharmaceutical Association made its appearance with the advent of the new year, and is generally considered as being a thoroughly creditable as well as a readable pamphlet.

The title-page is headed by the suggestive and evidently opportune motto "Pharmacia Vera Prevalebit." While this is undoubtedly true of true pharmacy we trust that it will also prove true of the *Bulletin.*

This initial number, in addition to a salutatory by the editor, Prof. C. S. N. Hallberg, contains the annual address of the president and also a number of reports of committees that are of current interest.

The second number of the *Bulletin* is, if anything, even more interesting than the first in that it contains an exhaustive account of the very interesting and highly important meetings of the Section on Education and Legislation, at Atlantic City, in September, 1905.

Ten Years of Electro-Chemistry at Niagara Falls.—The *Journal of the Franklin Institute* (Jan., 1906, page 42) gives a resumé of the progress that has been made in the electro-chemical industry at Niagara Falls. On October 19, 1895, the current was turned on at the plant of the Carborundum Company, the first to use electric power at this point. At the present time more than a dozen electro-chemical industries are flourishing within a radius of two miles of the Falls.

The list of products alone is an imposing one, while their economic value represents an annual total of many millions of dollars. Of the products that are more directly of interest to pharmacists we may enumerate: Aluminum, aluminum hydrate, phosphorus, sodium, potassium, sodium hydrate, sodium dioxide, potassium hydrate, calcium carbide, chlorinated lime, chlorine, potassium chlorate, sodium chlorate, hydrochloric acid and vanillin.

The Production of Borax in the United States.—All of the output of borax in the United States comes from California and the larger part of that from the Colemanite deposits in San Bernardino County.

The total product for the year 1904 amounted to 45,647 tons crude, valued at $698,810. Of this amount 38,000 tons, valued at $508,000, came from San Bernardino County, Cal., the remainder coming from Ventura and Inyo Counties.

The total imports of borax, borates and boric acid, for the same year amounted to 476 tons, valued at $44,857. (*Jour. Franklin Inst.*, Jan., 1906, page 69.)

The Production of Bromine in the United States.—American bromine is obtained chiefly from the salt brines of Michigan, West Virginia, Ohio, and Pennsylvania. The manufacture of bromine in the United States was begun in 1846, at Freeport, Pa., but subsequently has been carried on chiefly in certain areas of brine production which are mainly at or near Lake St. Louis, Mich.; Pomeroy, O.; and Malden, W. Va. To produce bromine the residual liquids or bitterns from the processes of salt manufacture are treated with sulphuric acid, thus forming hydrobromic acid. From this the bromine is separated by the use of an oxidizing agent which removes the hydrogen. For this purpose either chlorate of potash or binoxide of manganese is used. The total output of American bromine in twenty-five years has been 10,499,625 pounds, valued approximately at $2,887,917. During 1904 the total output amounted to 897,000 pounds, valued at $269,130. (*Jour. Franklin Inst.*, Jan., 1906, page 70.)

Cinchona.—Mr. David Howard, in a recent address before the Society of Chemical Industry, gave a very interesting review of the history of cinchona and its cultivation. He said, among others, that owing largely to the elimination of all other species except Ledgeriana the average content of quinine in cinchona has been raised to upwards of 5·5 per cent., that bark containing upwards of 10 per cent. of alkaloid is now common enough, and that 15 per cent. and even more is frequently met with. The average prices for cinchona in 1905 were the lowest since 1899.

Java Cinchona.—From a review of the Java cinchona cultivation it appears that there are seventy-five limited companies and six private undertakings at work in the Island. The majority of these companies have so far not been able to pay any dividends, while some pay well, and one, the "Gabes" Company, has paid as high as 200 per cent.

The production of cinchona in Java has increased from 4,000,000 kilos in 1897 to 7,225,000 kilos in 1904, while in other producing countries the production has decreased from 2,000,000 kilos in 1898 to 705,000 kilos in 1904. (*Chem. and Drug.*, January 13, 1906, page 68.)

The Preservation of Medicinal and Chemical Properties.—Mr. F. A. Upsher-Smith reviews the methods that have been suggested from time to time to prevent the decomposition of liquid preparations.

With few exceptions it may be taken as a rule that all medicinal and chemical substances should be stored in a cool place, protected from light, in well-closed bottles. Protection from light, *i. e.*, chemical or actinic rays of light, whether their source is the sun or artificial, is attainable by the use of amber glass bottles. Mr. Smith believes that the use of preservatives should be discouraged in official pharmacy. (*Chem. and Drug.*, January 13, 1906, page 56.)

Acetanilid in Bromo-Seltzer.—It is not generally known that bromo-seltzer is in reality one of the numerous acetanilid mixtures that are now so widely exploited and used as panaceas for all sorts and kinds of pain. According to the *Journal of the American Medical Association* (February 10, 1906, page 454) this preparation contains as its active constituents: potassium bromide, 10·53 parts; acetanilid, 4·58 parts, and caffeine, 1·20 parts. Or, that the advertised dose, 5·0 grammes, contains, approximately, potassium bromide, 0·5 gramme; acetanilid, 0·2 gramme, and caffeine, 0·05 gramme.

Alcho.—This is the proprietary name that has been given to a basic aluminum carbonate that occurs as an amorphous powder, insoluble in water, alcohol or ether. Alcho has been recommended as an efficient local disinfectant and astringent. (*Apothek. Zeit'g.*, 1905, page 1003.)

Artificial Albumin.—Emil Fisher, Professor of Chemistry at Berlin, announced in an address held in Berlin on January 6, 1906, that he had succeeded in blending together certain amino acids resulting in compounds that possess properties which correspond closely to those of the peptones. These compounds, which he calls peptids, are optically inactive like the natural proteins. The more complicated peptids, it is asserted, closely resemble natural albumin in their various properties. (*Jour. Am. Med. Assoc.*, February 10, 1906, page 443.)

Barutine.—Barutine is a compound of barium and theobromine, which combines the physiological diuretic properties of theobromine with those of barium in increasing the blood pressure. The toxicity of barutine is said to be much less than that of a corresponding quantity of barium chlorides. In affections of the heart or kidneys it is

prescribed in a 1·25 per cent. aqueous solution, of which the dose is a tablespoonful three times a day. (*Phar. Jour.*, January 20, 1906, page 59, from *Nouv. Rem.*)

Chloroform Solutions of Iodine.—Chassevault (*Presse Med.*, 1905, page 845) recommends the use of a solution of iodine in chloroform in the place of the usual tincture of iodine, for external application.

Histosan.—This is said to be a chemical combination of albumin with guaiacol. It occurs as a light-brown powder, having a slightly aromatic taste and smell. It is nearly, if not quite, insoluble in water, alcohol or ether, but is readily dissolved by weak solutions of the alkalies. Histosin has been recommended as being indicated in cases of tuberculosis, also in diarrhœa. Dose for adults, 0·5 gramme, three times a day. (*Apoth. Zeit'g.*, 1905, page 919.)

Nitron.—This is said to be a sensitive and reliable reagent for nitrates in aqueous solutions. Chemically it is described as diphenyl- endalino- dihydro triazol. It is claimed that nitron will positively indicate nitric acid in a dilution of $\frac{1}{80000}$. As a reagent a 10 per cent. solution of nitron, in 5 per cent. acetic acid, is used. To 5 or 6 c.c. of the suspected water add 1 drop of diluted sulphuric acid and from 6 to 8 drops of the nitron solution. If there is an immediate turbidity or if within one or two minutes glistening needle-shaped crystals separate out from the solution, the water contains more than 100 milligrammes of N_2O_5 in each liter. If within half an hour no precipitate is produced, the water contains less than 25 milligrammes of N_2O_5 in each liter.

Nitron may also be used for the gravimetric estimation of nitrates. (*Phar. Post*, 1905, page 781.)

Proponal—Dipropyl barbituric acid is a homologue of veronal in which the two ethyl groups are replaced by two propyl groups. Proponal is a colorless crystalline substance that melts at 145° C. and is soluble in about 70 parts of boiling water and in about 1640 parts of cold water, but is readily soluble in dilute solutions of the alkalies. It is said to be more active than veronal, and is given in doses of 0 15 to 0·5 grammes. (*Apoth Zeit.*, 1905, page 1001.)

Protosal.—The salicylic ester of glycerin formaldehyde occurs as a colorless oily liquid that has a specific gravity of 1·344 at 15° C. It is freely soluble in alcohol, chloroform or castor oil, and is to be used externally, as an embrocation, in rheumatic affections. (*Phar. Zeit.*, 1905, page 1044.)

Santyl.—This is described as being the salicylic acid ester of santalol, and occurs as a light yellow, nearly odorless and tasteless, oily liquid that is insoluble in water, but readily soluble in alcohol or in ether. Santyl may be given in place of santalol or oil of santalwood in doses of 1 or 2 c.c. (*Apoth. Zeit.*, 1905, page 964.)

Zymphene.—Sodium metaoxycyanocinnamate occurs as yellowish crystals that are soluble in water and in alcohol. It has been recommended as being a tonic and digestive stimulant in cases of loss of appetite due to digestive derangement or other causes. It is given in doses of 0·5 gramme, and is stated to be non-toxic and antiseptic. (*Phar. Jour.*, Jan. 13, 1906, page 50.)

THE USE OF METALLIC COPPER FOR THE PURIFICATION OF DRINKING WATER.[1]

By Prof. Henry Kraemer, Philadelphia.

Before giving the results of my experiments with copper foil in destroying certain intestinal organisms, I desire to give some general observations with regard to the use of copper in the purification of water supplies, as the subject presents itself to me.

What I wish to bring out is that there appear to be distinct uses for copper foil and for copper sulphate or the salts of copper, and also that there is a proper time and place for the use of these.

Copper foil seems better adapted for use in the average household, and may be used when the drinking water supplied to a community is a diluted sewage, as it is in a number of places.

Salts of copper seem better adapted for disinfecting the discharges of typhoid patients, treatment of sewage, and the purification of contaminated water in reservoirs.

Theoretically, there should be no need of treating either the water in a reservoir (except where there is algal growth) or that which is supplied the householder from the city supply, except when there is contamination as a result of accident, as sometimes happens, granting that the sources of contamination have been properly safeguarded.

The discharges from typhoid patients being the source of the dis-

---

[1] Reprinted from the *Journal of the New England Water Works Association*, Vol. XIX, No. 4, p. 487.

ease, it is obvious that the disinfection with copper sulphate should begin here, and physicians should give instructions accordingly. If universal attention were given to this matter, there can be little doubt that the spread of typhoid fever would be prevented almost entirely. But as the matter cannot be absolutely controlled, the next best thing is to *disinfect the sewage.*

That certain organisms manifest a specific sensitiveness towards copper was first pointed out by Naegeli. Following the lead of Naegeli, Israel and Klingmann (1897) showed that copper foil has a marked toxic effect on certain bacteria, as *Bacillus coli* and the organisms producing typhoid fever and cholera. To Moore and Kellerman (1904) belongs the credit of first showing the application of the results obtained by Naegeli (on algæ) and Israel and Klingmann (on bacteria) in the purification of water supplies.

As the methods used in my work have been published and are readily accessible, it will probably be sufficient to call attention to some of the main features of the work.

(1) The copper used was in the form of sheet copper or copper foil, pieces approximating 9 centimeters square being used to each 1,000 c.c. of water.

(2) The organisms upon which we experimented were *Bacillus coli* and *Bacillus typhi*, twenty-four-hour bouillon cultures being used.

(3) The water used in the experiments included filtered, distilled and tap water, all of which were sterilized in an autoclave prior to adding the cultures and copper foil.

We found in nearly every experiment which we conducted that in the water containing the typhoid or colon organisms, and to which the copper foil was added, these organisms were destroyed in from two to four hours.

We also found in the parallel experiments which we conducted that in the water to which copper foil was not added, the typhoid and colon bacilli continued to grow and even multiply for months, except in the case of water filtered by means of a filter attached to an ordinary copper faucet. In the latter instance the typhoid organisms were destroyed in two to four hours, just as though copper ha l been added to the water, whereas the colon bacilli continued to grow, but not as rapidly as in distilled or tap water. This peculiar inhibiting action of the filtered water we subsequently proved was due to a property acquired by the water in its slow passage through

the copper spigot to which the filter was attached. That the inhibiting action of the filtered water was due to its contact with the copper spigot is shown by the fact that when we used a filter in which contact with copper was avoided, the typhoid organisms continued to grow the same as in distilled and tap water.

Later experiments showed that contact of the copper foil with the water for a very brief period of time was sufficient to affect these organisms. We found, for instance, that if the copper foil were allowed to remain in distilled water for one to five minutes, the typhoid organisms were completely destroyed within a few hours.

In a paper presented to the American Philosophical Society, the results of my work along this line are summarized as follows:

Certain intestinal bacteria like colon and typhoid are completely destroyed by placing clean copper foil in water containing them, or by adding the organisms to water previously in contact with copper foil.

The toxicity of water to which either copper coins or copper foil has been added is probably due to a solution of some salt of copper, as first suggested by Naegeli.

The copper is probably in the form of a crystalloid rather than that of a colloid, as it has the property of permeating the cell walls and organized cell contents of both animals and plants, thereby producing the toxic effects.

While the effects produced by the oligodynamic action of copper are apparently different from those of true chemical poisons, the difference is probably in degree only and not in kind.

Certain lower organisms, including both plants and animals, possess a specific sensitiveness to minute quantities of copper, and it has been shown that they are not restored on transferring them to water free from oligodynamic properties.

Oligodynamic solutions of copper are obtained by adding either copper coins, copper foil, or salts of copper to water; when copper foil is used, sufficient copper is dissolved by the distilled water in one to five minutes to kill the typhoid organisms within two hours.

A solution of copper may lose its toxicity by the precipitation of the copper as an *insoluble salt* or *compound;* by its *absorption* by *organic substances;* or by *adsorption* by *insoluble substances.*

The oligodynamic action of the copper is dependent upon temperature, as first pointed out by Israel and Klingmann.

The effects of oligodynamic copper in the purification of drinking water are in a quantitative sense much like those of filtration, only the organisms removed, like *Bacillus typhi* and *Bacillus coli*, are completely destroyed.

THE EFFECTS OF WATER TREATED WITH COPPER ON MAN.

While it has been conclusively shown that exceedingly minute quantities of copper are toxic to typhoid organisms, still the question is raised by some as to the toxic effects on man when copper or its salts are used in the purification of drinking water. In commenting on a paper of mine on "The Efficiency of Copper Foil in Destroying Typhoid and Colon Bacilli in Water," a reviewer writes as follows: "While recommending the use of copper foil for the purification of drinking water, the writer adduces no proofs as to freedom from toxic effects when water so purified is taken into the system over a considerable period of time." My reason for not taking up the pharmacological phase of this question heretofore has been that my own experiments in the consumption of water treated with copper foil did not extend over a sufficient period of time to warrant me in making any statements in regard to the effects of water so treated. Then, too, I felt that the statements of pharmacologists and physiologists were conclusive as to the probable harmlessness to man of copper when used in the proportions necessary to purify water containing typhoid organisms. But since there seems to be some objection in certain communities to the drinking of water treated with copper, I have deemed it advisable to give my own experience in connection with this subject.

For nearly a year all of the drinking water consumed in my home has been treated with copper. A strip of copper foil, or sheet copper, 9 inches square, is placed in a vessel containing from 3 to 4 quarts of water and allowed to remain from four to eight hours. The foil is first cleaned with powdered pumice, and retains its lustre for weeks unless the water contains a considerable quantity of sediment, and provided the quantity of water is renewed immediately each time upon drawing off the sterilized or purified water. On account of the varying amounts of sediment, we find it desirable to filter the water before treating it with copper foil. Up to this time no ill effects have been noted from drinking the water so treated, and, in fact, our general health may perhaps be said to be better

than usual, in that we have not had to consult a physician during this time. Another interesting observation is that the water being more palatable than boiled water, we consume larger quantities, which possibly has some influence on the general bodily condition.

Believing that many vegetables may also be a source of infection, we take the precaution either to wash the vegetables to be eaten raw with copper-treated water, or to place them, particularly in the case of lettuce and celery, in a vessel of water along with a strip of clean copper foil and allow them to remain from two to four hours with occasional agitation.

The use of copper vessels would be more convenient, but, of course, is more expensive. I have also thought that water pitchers and tumblers might be partly lined with copper foil.

From my own experience and observations, together with those of others, we may draw certain general conclusions, which I have summarized as follows:

It is pretty well established that the typhoid organism is disseminated not only through water, but also through air and food, and may retain its vitality for a considerable period of time.

Typhoid organisms in water are eliminated by filtration, boiling, and by certain biochemical methods. Of the latter, the use of copper, as proposed by Moore and Kellerman, is probably the most efficient and at the same time the most practicable.

While exceedingly minute quantities of copper in solution are toxic to certain unicellular organisms, as bacteria, it is safe to assume that the higher plants and animals, including man, are unaffected by solutions containing the same, or even larger amounts of copper.

There being a number of factors which tend to eliminate the copper in solution, it is hardly likely that there would be any copper in solution by the time the water from a reservoir reached the consumer if the treatment of the reservoir were in competent hands.

Many plants contain relatively large quantities of copper, and when these are used as food, some of the copper is taken up by the animal organism, but there are no records of any ill effects from copper so consumed.

SALE OF NARCOTICS AND OF PROPRIETARY MEDICINES CONTAINING ALCOHOL.

On December 27 and 28, 1905, upon the invitation of the Legislative Committee of the American Pharmaceutical Association, a conference was held at the Hotel Stratford in Chicago to consider legislation to regulate the sale of narcotics and proprietary compounds containing alcohol. There were present at this conference delegations representing the American Pharmaceutical Association, the Proprietary Association of America, the National Wholesale Druggists' Association and the National Association of Retail Druggists.

The delegates were not authorized to take final action as to any particular form of a law, but were merely appointed to confer together and refer back to the bodies which appointed them. There was considerable discussion, and the following was regarded as a good working basis for a discussion of possible laws to regulate the sale respectively of narcotics and of proprietary compounds containing alcohol.

ALBERT E. EBERT,
Of the American Pharmaceutical Association.
J. M. GOOD,
Of the National Association of Retail Druggists.
M. N. KLINE,
Of the National Wholesale Druggists' Association.
JOHN W. KENNEDY,
Of the Proprietary Association of America.

A BILL

To Provide Against the Evils Resulting from the Traffic in Certain Narcotic Drugs, and to Regulate the Sale Thereof.

***Be it Enacted by the General Assembly of the State of* ______________.**

SECTION 1. That it shall be unlawful for any person, firm or corporation to sell, furnish or give away any cocaine, alpha or beta eucaine, opium, morphine, heroin, chloral hydrate or any salt or compound of any of the foregoing substances, or any preparation or compound containing any of the foregoing substances, or their salts or compounds, except upon the original written order or prescription of a lawfully authorized practitioner of medicine, dentistry or veterinary medicine, which order or prescription shall be dated and

shall contain the name of the person for whom prescribed, or if ordered by a practitioner of veterinary medicine shall state the kind of animal for which ordered, and shall be signed by the person giving the prescription or order. Such written order or prescription shall be permanently retained on file by the person, firm or corporation who shall compound or dispense the articles ordered or prescribed, and it shall not be again compounded or dispensed, except upon the written order of the original prescriber for each and every subsequent compounding or dispensing. No copy or duplicate of such written order or prescription shall be made or delivered to any person, but the original shall at all times be open to inspection by the prescriber and properly authorized officers of the law.

Provided, however, that the above provisions shall not apply to preparations containing not more than 2 grains of opium or not more than $\frac{1}{4}$ grain of morphine, or not more than $\frac{1}{4}$ grain of heroin, or not more than $\frac{1}{8}$ grain of cocaine, or not more than $\frac{1}{8}$ grain of alpha or beta eucaine, or not more than 10 grains of chloral hydrate, in 1 fluid ounce; or if a solid preparation, in 1 avoirdupois ounce. Provided also that the above provisions shall not apply to preparations containing opium and recommended and sold in good faith for diarrhea and cholera, each bottle or package of which is accompanied by specific directions for use, and a caution against habitual use, nor to powder of ipecac and opium, commonly known as Dover's Powder, nor to liniments or ointments when plainly labeled "for external use only." And provided further that the above provision shall not apply to sales at wholesale by jobbers, wholesalers and manufacturers to retail druggists or qualified physicians, or to each other, nor to sales at retail by retail druggists to regular practitioners of medicine, dentistry or veterinary medicine, nor to sales made to manufacturers of proprietary or pharmaceutical preparations for use in the manufacture of such preparations, nor to sales to hospitals, colleges, scientific or public institutions.

Sec. 2. It shall be unlawful for any practitioner of medicine, dentistry or veterinary medicine to furnish to or to prescribe for the use of any habitual user of the same any cocaine, heroin, alpha or beta eucaine, opium, morphine, chloral hydrate, or any salt or compound of any of the foregoing substances, or any preparation containing any of the foregoing substances or their salts or compounds. And it shall also be unlawful for any practitioner of dentistry to

prescribe any of the foregoing substances for any person not under his treatment in the regular practice of his profession, or for any practitioner of veterinary medicine to prescribe any of the foregoing substances for the use of any human being.

Provided, however, that the provisions of this section shall not be construed to prevent any lawfully authorized practitioner of medicine from furnishing or prescribing in good faith for the use of any habitual user of narcotic drugs who is under his professional care such substances as he may deem necessary for their treatment, when such prescriptions are not given or substances furnished for the purpose of evading the provisions of this act.

Sec. 3. Any person who shall violate any of the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction for the first offence shall be fined not less than $25 nor more than $50, and upon conviction for a second offence shall be fined not less than $50 nor more than $100, and upon conviction for a subsequent offence shall be fined not less than $100 nor more than $200, and shall be imprisoned in the county jail for not more than six months and if a licensed pharmacist, physician, dentist or veterinary surgeon, his license shall be revoked. It shall be the duty under this act of all judges of the Courts of Common Pleas in this State, at every regular term thereof, to charge all regularly impaneled grand juries to diligently inquire into and investigate all cases of the violation of the provisions of this act and to make a true presentment of all persons guilty of such violations. It shall be the duty of the Board of Pharmacy to cause the prosecution of all persons violating the provisions of this act. No prosecution shall be brought for the sale of any patent or proprietary medicine containing any of the drugs or preparations hereinbefore mentioned until the Board of Pharmacy shall certify that such medicine contains any of the said drugs or preparations in excess of the maximum percentages hereinbefore mentioned.

Sec. 4. In any proceedings under the provisions of this act the charge may be brought against any or all of the members of a partnership, or against the directors or executive officers of a corporation, or against the agent of any person, partnership or corporation.

Sec. 5. All laws and parts of laws in conflict with this act are hereby repealed.

SEC. 6. This act shall take effect and be in force from and after the day of 19 .

A BILL

To Regulate the Sale of Certain Proprietary Medicines.

Be it Enacted, etc.

SECTION 1. Any proprietary medicine which contains a percentage of alcohol greater than is reasonably necessary for the extraction and dissolving of the active constituents of the drugs used in the preparation of said medicine or to prevent the precipitation of such active constituents or to preserve the medicine from fermentation or freezing, shall be deemed to be an intoxicating liquor and shall be sold only under the provisions of the law regulating the sale of intoxicating liquors. Provided that this act shall not be construed to apply to preparations compounded according to any formula embraced in the United States Pharmacopœia or the National Formulary, when sold under a title recognized by the said United States Pharmacopœia, or National Formulary.

SEC. 2. No prosecution shall be brought for the sale of any proprietary preparation in violation of the provisions of this act unless the Board of Pharmacy shall, after due investigation, certify that such proprietary preparation contains alcohol in a percentage greater than the limit fixed by Section 1.

BOOK REVIEWS.

BIBLIOGRAPHICAL INDEX OF NORTH AMERICAN FUNGI. By William G. Farlow. Volume I, Part I. Abrothallus to Badhamia. Issued September 1, 1905. Published by the Carnegie Institution of Washington. 1905.

One of the great needs of the scientific investigator is that of bibliographic compilations which will enable him readily to look up the literature bearing on the research problems which engage his attention. Most investigators probably spend as much time in looking up references and going over literature as they do in their actual research work. Therefore a work so complete as this Index is very welcome.

This stupendous work by Professor Farlow, of which we now have the first part, has been in preparation for over thirty years. It is a summary of all the literature on systematic mycology, excluding that on bacteria and the saccharomycetes. The classification adopted

is based upon both the Sylloge of Saccardo and the Pflanzenfamilien of Engler and Prantl. With some exceptions, the author has adopted the principle of using the oldest specific name under which a species is described. About 150,000 references have been brought together in this work, and these, together with numerous cross-references, are arranged in alphabetical sequence. In many instances, particularly where the synonym is disputed or confused, the results of Dr. Farlow's studies of authentic specimens in conjunction with collateral reading are embodied in the form of notes under different genera and species.

Dr. Farlow is always interesting in what he has to say, but probably never more so than when treating of the subjects of nomenclature and taxonomy. Probably no one is so familiar with the literature of botany, especially that of the fungi, as Dr. Farlow, and no one is more capable of discerning the errors of authors and the fallacies of the different schools of botanists. For this reason his influence on botanical thought and work has been most beneficial. In the preface to the volume at hand Dr. Farlow shows the folly of attempting to make hard and fast rules in nomenclature. He says: "It is best not to make too violent attempts to interpret the older mycologists, but to be content with letting the dead bury their dead. The business of reviving corpses has been carried altogether too far in mycology. . . . At the Vienna Congress it was voted to accept a list of certain genera of spermaphytes whose names are to be retained regardless of strict priority. It is to be hoped that at the next Congress a similar list of cryptogams will be presented so that in the case of genera clearly defined and generally recognized under names in use for many years, they may be regarded as fixed and exempt from future changes on the ground of priority."

This Index will stand as a monument to the energy, patience and ability of Dr. Farlow, and it is fortunate that the Carnegie Institution is willing to undertake the publication of works of this kind.

PHARMACEUTICAL MEETING.

The regular monthly Pharmaceutical Meeting of the Philadelphia College of Pharmacy was held on Tuesday afternoon, February 20th, with Prof. Samuel P. Sadtler in the chair.

Prof. Virgil Coblentz, of the College of Pharmacy of the City of

New York, gave an address entitled "Comments on the Chemicals of the Eighth Decennial Revision of the U. S. Pharmacopœia," which will be published in full in a subsequent issue of this JOURNAL.

Dr. C. B. Lowe expressed himself as much pleased with the address and moved that a vote of thanks be tendered Professor Coblentz for presenting it, which motion was unanimously adopted.

Prof. Joseph P. Remington said that he was very glad that Professor Coblentz had explained in detail the work connected with the revision of that portion of the Pharmacopœia relating to inorganic chemicals, and said that he could testify to the great amount of work done by the committee having this work in charge. He said that commendations from all over the world, including those from the highest authorities, show this revision of the U. S. Pharmacopœia to be far ahead of any yet published. He then referred to the Digest of Criticisms which the Committee of Revision had compiled for the use of the members, and said that only about 2 per cent. of the criticisms made on the 1890 edition were found to have any value, the others showing for the most part merely differences of opinion. He expressed the hope that the criticisms on the eighth decennial revision would be of more value, and said that they will all be considered. Continuing, Professor Remington said that every change in the Pharmacopœia is likely to affect some one. In the first place, preparations must be made to conform to it, and this may involve some loss and trouble; then again, there are those who object to change, preferring to go on in the old way, and hence criticism is likely to arise. On the other hand, he said, it should be understood that the Pharmacopœia is a book of standards for medicines, and not for analytical chemists. He then referred to the rubric for chemicals, which he said had not been adversely criticized, and in this connection called attention to the great purity of the tartaric acid and sodium bicarbonate on the market (these containing from 99·5 to 99·9 per cent. of the pure chemical), offering in explanation of this the fact of the rivalry between the Cleveland and Royal baking-powder companies, each making a claim for the purity of their products. In concluding his remarks Professor Remington referred to the criticism that the Pharmacopœia is a manufacturers' book, and asked how it could be anything else when all of the chemicals are made by manufacturers and not by druggists themselves.

Professor Coblentz said with regard to the criticisms pertaining to

the inorganic chemicals of the 1890 edition that the most valuable were those made by the chairman of that committee. He spoke of the purity of the cream of tartar on the market and said that the product made by the trust required but little purification for standard purposes. Calling attention to the salicylates he said that bleaching with sulphurous acid gives them their very white appearance. Professor Coblentz stated that the Pharmacopœia does a great deal of good by compelling druggists to buy the better grades of chemicals. He recalled an instance where a manufacturer had failed to sell one grade of a certain chemical which was only one-half cent more per pound than an inferior grade. To illustrate further, he said that the purest zinc oxide manufactured goes to the manufacturers of paints rather than to druggists. Another example given was that of commercial sodium phosphate, which he said contained a large amount of arsenic, and yet some pharmacists prefer this to the purer article although there is not much difference in the price.

Prof. Clement B. Lowe read a paper on the "Doses in the U. S. Pharmacopœia," which will appear in a later issue of this JOURNAL.

In discussing the paper, M. I. Wilbert said that as generally understood an average dose means one that can be doubled, tripled, or quadrupled at the time, so that a low dose is desirable. Only in one or two instances did he consider the average doses as given in the Pharmacopœia to be high, and mentioned as one example that of acetanilid.

Dr. Lowe did not entirely coincide with this view of the question, and said that not only should the dose be taken into consideration, but also the question as to the length of time required for the elimination of the drug from the system.

M. I. Wilbert, Ph.M., presented a quarterly review of the advances in pharmacy. (See page 129.)

Professor Sadtler referred to the movement instituted by the *Ladies' Home Journal*, *Collier's Weekly*, and to the work of the Council on Medicine and Chemistry of the American Medical Association, and said that if the members of the Association continue to support it that the nostrum business will eventually be dissolved.

Professor Remington thought that the movement would lead to legislation compelling the printing of the formula on the label.

FLORENCE YAPLE,
Secretary pro tem.

NOTES AND NEWS.

BULLETIN OF THE AMERICAN PHARMACEUTICAL ASSOCIATION. — The Council of this Association has appropriated $500 for the publication of a monthly bulletin, the expenditure of the same to be under the direction of the editor, Prof. C. S. N. Hallberg. Two numbers of the *Bulletin* have thus far appeared. They contain the transactions of the last annual meeting and are printed from advance sheets of the annual report. In the editorial comment of the February issue attention is called to the first local branch of the Association, which was organized in Chicago on January 16th. The meeting was convened by Prof. Oscar Oldberg, Professor Hallberg acting as chairman. It is to be hoped that other local branches will be organized and that thus the interest in the work of the Association will be augmented, and that thereby the membership will be much increased. There is no reason why the Association should not number 5,000 members by 1910.

J. H. REDSECKER, of Lebanon, Pa., read an interesting paper before the Lebanon County Historical Society on "The Women's Aid Society of Lebanon During the War of the Rebellion," in which he stated that this society fed tens of thousands of soldiers on their way to the war, and rendered efficient aid to the Sanitary Commission and other similar organizations.

WILD MEDICINAL PLANTS OF THE UNITED STATES.—The Bureau of Plant Industry of the U. S. Department of Agriculture has recently issued a bulletin on this subject which was prepared by Miss Alice Henkel, Assistant in Drug Plant Investigations. The common and scientific names of the plants are given and also the localities in which they occur.

WILLIAM MCINTYRE was recently made chairman of a sub-committee of the Board of Public Education in Philadelphia, which has charge of the Municipal School Gardens. Miss Helen C. Bennett is the Supervisor of the Gardens, which were organized May 12, 1904.

PROF. H. H. RUSBY has been recently re-elected president of the Torrey Botanical Club, which is the oldest and probably the most influential organization of botanists in this country. It was through one of its members, Dr. Britton, that botany as a distinct department at Columbia University was developed, and later through him and other members of the club that the New York Botanical Garden, which is destined to become the "Kew Gardens of America," was organized.

THOMAS S. WIEGAND, Librarian of the Philadelphia College of Pharmacy, has just completed fifty years of active service in the college, and it is proposed to commemorate his service by the endowment of a scholarship to be known as the "Thomas S. Wiegand Scholarship." For this purpose it is proposed to collect a fund of $3,000 from the graduates of the college and friends of Mr. Wiegand. The trustees of this fund are Prof. Joseph P. Remington, President Howard B. French and George M. Beringer, the latter of whom is the treasurer of the committee and to whom subscriptions should be sent.

… THE AMERICAN
JOURNAL OF PHARMACY

APRIL, 1906.

THE USE OF PRESERVATIVES IN FOODS.[1]

BY H. W. WILEY.

The question which has been long under discussion concerning the use of chemical preservatives in foods seems now to be approaching a final answer. The points which have been most discussed are, first, the necessity for the use of chemical preservatives, and, second, their effect upon health and digestion. The first of these problems relates largely to technical questions and to commercial operations and is one which is very properly discussed by both manufacturer and consumer. The second is a question of wholesomeness or harmfulness and cannot be properly discussed either by manufacturer or consumer unless such manufacturer or consumer is also a physiological chemist, a physician, or hygienist.

It is with pleasure that I have accepted your invitation to-day to open the discussion on this important subject which has of late been much in the public mind. I wish to state so far as possible the positions occupied by those who have favored the use of chemical preservatives in foods and also those who have discouraged the use thereof.

First of all, let us have a clear understanding of the class of bodies to which this discussion applies, namely, chemical preservatives. I mean by a chemical preservative one which is practically devoid of any condimental value, and which in the quantities used in foods imparts no distinctive odor or taste thereto and which possesses germicidal properties sufficient to destroy or paralyze bacteriological action and thus prevent that class of fermentations which lead

[1] Address delivered before the Philadelphia College of Pharmacy, March 20, 1906.

to decay. I do not refer in any respect to condimental substances which incidentally may possess to a limited extent germicidal properties. During the last month this whole matter of the use of chemical preservatives has been presented to the Committee on Interstate and Foreign Commerce of the House of Representatives and the hearings have been printed as an official document entitled, "Hearings before the Committee on Interstate and Foreign Commerce of the House of Representatives on the Pure Food Bills H. R. 3040, 4527, 7018, 12071, 13086, 13853, and 13859."

The multitude of bills regulating interstate commerce in adulterated and misbranded foods and drugs which was under consideration is illustrated by the above list. A large number of representatives of interests affected by the bill appeared before the Committee for the purpose of securing in the legislation the legalization of the use of preservatives and coloring matters in food products. A number of experts also appeared before the Committee employed by the interested parties above mentioned for the purpose of furthering their interests. Four experts gave evidence in the matter, namely, Prof. Edward Kremers, of the University of Wisconsin; Prof. Frank Kedzie, of the Agricultural College of Michigan; Prof. Victor C. Vaughan, of the University of Michigan, and Dr. R. G. Eccles, of Brooklyn. All who are interested in the latest phases of the question under discussion should read this evidence, which doubtless could be obtained by addressing any of your senators or representatives in Congress.

I will summarize first the arguments of the manufacturers of foods and antiseptics. The gist of their arguments was that it is impossible to preserve certain kinds of foods without the use of antiseptics. When pressed for an answer as to the kinds of foods, it was developed that the classes referred to were chiefly substances like catsup, sweet pickles and fruit syrups for soda fountains. Practically all of the arguments advanced were confined to those classes of bodies. It was admitted by all that ordinary canned foods, whether fruits, vegetables or meats, could be well preserved without the use of antiseptics, and that in so far as cured meats were concerned, antiseptics were convenient but not indispensable. It also appeared in the evidence that even such a substance as catsup or fruit syrup could be well preserved by sterilization until it was opened for use, and that the chief use of the antiseptic was to pre-

serve the contents of the bottle after opening until they were entirely consumed.

The experts were not agreed among themselves as to the proper quantities of antiseptics to be admitted nor as to the kind of antiseptics which should be used. In general, they were opposed to the use of salicylic acid, sulphurous acid and formaldehyde, and favored the use of boric acid and benzoic acid. No satisfactory reasons were forthcoming for discriminating between these acids, save that the manufacturers themselves had generally abandoned the use of all the other preservatives except these two.

The expert testimony brought out the well-known fact that benzoic acid, especially, was contained in many food products and was therefore to be considered as a normal food constituent. With the exception of the cranberry, it appeared that no ordinary food contained anything more than a mere trace of benzoic acid. One of the principal arguments in favor of the wholesomeness of benzoic acid was based upon the fact that it occurred naturally in the cranberry. When it was represented to the Committee that the same logical conclusion would apply to the use of alum, arsenic, copper and hydrocyanic acid in foods, the untenability of the position maintained by these experts was at once brought out. One of the experts, Dr. Eccles, maintained that the exclusion of preservatives from foods was the cause of the high death-rate in Berlin and South Dakota. The data which he presented in support of this contention did not appear to be of a very conclusive character, and, as regards North Dakota, these data were shown to be wholly erroneous by Professor Ladd, the State Dairy and Food Commissioner of that State, not in a paper presented to the Committee but in an answer to the same argument of Dr. Eccles previously published. The most powerful support of the argument in favor of the use of antiseptics was given in the testimony of Dr. Vaughan. Dr. Vaughan stated in his testimony (page 65) the following:—

"I am sure that benzoic acid in the quantities in which it is used in tomato catsup, sweet pickles, etc., one part to 1200 or 2000, does not do any harm. I should be opposed to the use of formaldehyde in milk in any quantity or the use of any other preservatives in milk. I have testified repeatedly against the use of sulphite of soda on hamburger steaks."

Again on page 66, referring to our own experiments in Washington, he says:—

"But they have not shown that boric acid in the small quantities which should be used as a preservative, if used at all, has any effect on the animal body."

Mr. Adamson.—What do you mean by small quantities?

Mr. Vaughan.—I mean one-half of one per cent.

When asked by Mr. Mann how much benzoic acid you can eat Mr. Vaughan stated (page 72):—

"I would have to answer only in a general way, and say a grain or two, I am sure, taken day by day for one's life, would not do one any harm."

Mr. Mann.—Do you mean one grain or two grains?

Mr. Vaughan.—One grain.

Mr. Mann.—Would two grains do any harm?

Mr. Vaughan.—Well, I do not know. I should say one grain would be perfectly safe. I do not know whether two grains would be or not.

It seems that the real reason or reasons which should have been advanced before the Committee were masked somewhat by the contentions outlined above. There is no doubt of the fact that it is far cheaper and more convenient to produce certain food products with the aid of chemical preservatives than it is to preserve them in any other way, and the actual reason which is behind all this contention of the manufacturers and experts is the production of a cheaper quality of goods. There can be no objection to this desire if properly carried out, but in the securing of the cheaper varieties it hardly seems fair to threaten the whole list of foods with adulteration. The most disingenuous of all the arguments presented was that of the packers of codfish, who claimed immunity from the provisions of any act under the specious guise of requiring that the judgment which is to be pronounced upon a product to which the external application of a preservative is made and which requires to be macerated or soaked before use, should be pronounced only at the time the material was fit for consumption and not in the state in which it entered the market. This contention had such powerful influence as to meet with approval on the part of both the Senate and the House, and is embodied in a provision of the bill covering the points, as stated above. Apparently, it might seem that this

provision would apply to all preservatives, since they are all applied first externally and are only mingled with the material afterward. The greatest fault of a provision of this kind is its ethical offense rather than its practical application.

OBJECTIONS TO THE USE OF CHEMICAL PRESERVATIVES.

I will try and state now the principal objections to the use of chemical preservatives in foods. In the first place, I may call attention to the fact that they are never necessary except perhaps in some emergencies. I mean that in the ordinary commerce in foods and the preservation of foods necessary to that commerce, the use of chemical preservatives is never a necessity. I will admit without argument that it is far better to have foods preserved with chemical antiseptics than to have no foods at all and, therefore, whenever it is a question between starvation and antisepsis the latter is preferable. Such an emergency, however, in the present constitution of the world is a very remote one. The methods of transportation are now of such a character that if by some misfortune the supply of food should fall short in any locality, it is easily and quickly supplied from other more favored localities. The methods of the sterilization of food products by heat have now reached such perfection that all substances which are not rendered unsuitable for consumption by the application of heat can be easily preserved thereby; that is, vegetables, cooked fruits, cooked meats, fish, oysters, etc., are easily and perfectly sterilized and in this state will keep in edible condition for an indefinite length of time.

Without dwelling too long on a process so well known as sterilization, I may pass to the utilization of a low temperature for the preservation of such food products as are not suitable for sterilization by heat. The magnitude of the cold storage industry has vastly increased in the past few years and its technique been very much improved. There are certain food products which actually improve for a certain time in cold storage, such as fruits, meats, poultry and game. There are other food products which are not improved by cold storage, but which are kept in reasonably good condition for a limited time therein, namely, eggs, fish, butter, etc. While there are often temptations to keep food products too long in cold storage, its immense utility in the proper preservation of foods must not be lost sight of.

In the third place, the old and well-known process of curing food products or preserving them by condimental substances is still of great value and always will be. Not only are foods preserved or cured by these condimental substances, but there are produced during this time certain flavors or aromas which render these foods of high value. The ripening of cheese is an illustration of the changes which take place in foods during the curing process; the flavor of the ham, of bacon and of corned beef are other well known illustrations. Thus the curing process is valuable not only because the condimental substances employed are incidentally of a preservative character, but because some of the natural fermentations which take place during curing are not inhibited by the condimental substances, but go on in a normal way to produce the flavors and aromas which make such cured products so palatable and attractive.

Thus it is seen that there are at the service of man wholly unobjectionable and even useful methods of preserving food products which render it unnecessary to resort to that method of preservation which I might call *vi et armis*, which is the one resorted to by the chemical preservative manufacturer.

Another very grave objection to the use of chemical preservatives is in the fact that it prompts the utilization of unsuitable, partially decayed, or unripe products, or the refuse of factories for food products. It was developed in the evidence before the Interstate and Foreign Commerce Committee that vast quantities of tomato pulp were prepared during the canning season and kept by the addition of a chemical preservative until a less busy season permitted their manufacture into catsups and similar bodies. Such a method of procedure is always a great temptation to utilize the poorest, partly decayed, or refuse matter brought to the factory or otherwise left in the field, and this temptation, unfortunately, is not always resisted. When in addition to a preservative it is permitted to use an artificial color so that these waste products can be made to imitate the best and ripest of tomatoes, the deception is more complete and the temptation more irresistible. This objection to the use of preservatives is well stated by Dr. Vaughan in his testimony before the Senate Committee, February 28, 1900, 55th Congress, page 203. He says, in speaking of a preservative:—

"In the first place, like coloring matter, it enables a man to sell a poor grade article in place of a better grade; in the second place

it enables the manufacturer to be less careful in other means of preservation. For instance, if he is putting up a can of peaches or pears, or anything of that kind, if he will add a little salicylic acid he need not be so careful in his sterilization. That is a very important thing. I do not think salicylic acid or butyric acid, or anything of that kind, ought to be allowed in preserving fruits or jellies because if sterilization is complete these things can be kept without any antiseptic added." The term "butyric" here is doubtless a misprint for "benzoic" since the use of butyric acid as a preservative is not practiced with foods.

I believe, therefore, that the general use of preservatives in the preparation of food products would place a premium on carelessness, dirt and inferiority.

The use of chemical preservatives is also objectionable on the score of health. These preservatives in order to be effective must be in sufficient quantity to either kill or paralyze all bacterial action. It is reasonable to believe that a body powerful enough to do this would be powerful enough to injure the cells of the human body with which it might be brought into contact. This point is well brought out by Prof. W. D. Halliburton, the celebrated physiologist, in his testimony before the English Departmental Committee, page 263, in answer to question 7528, and following:—

"I would say at the outset that the kind of evidence that I have to offer is not very largely clinical. The amount of medical practice which I have seen is limited. Very soon after my student days I took to physiological work, and I have remained at that more or less ever since, so that the actual observations that I have to make are in the nature of physiological experiments, and deal principally with the two chief substances that you have under investigation, as I understand—compounds of boron and formaldehyde. On general principles one would object to the continuous use of antiseptics. The substance which would destroy the life of micro-organisms could not be expected to be beneficial to the life of a higher organism; it would be largely a matter of dose. I mean to say the same dose that would kill a bacterium would not necessarily kill a man, but still it would be hostile to the protoplasmic actions that constitute the life even of a high animal like man.

"Q. 7541 (p. 264). Then, as to boric acid, you have made extensive experiments?—A. With borax and borates I have made

a fair number of experiments. In the introduction I allude to what is known as 'borism.' The eruption occurs on the skin of certain individuals as the result of the use of either boric acid or borax. There have been other cases recorded—although here again I cannot speak personally—in which dyspeptic troubles have arisen. There have been a fair number of experiments performed upon animals.

"Q. 7544. Boric acid is the commoner preservative, is it not?—A. I am not so sure. I think very largely a mixture is used that is called 'glacialin'—a mixture of boric acid and borax. In animals the chief advantage, if one may put it so, of the poison is that it is not cumulative; it does not accumulate in the body, but it is rapidly eliminated by the urine."

Professor Halliburton says further, in answer to question 7572: "May we take it, then, that in your view you are absolutely opposed to the use of formalin? Yes.

"Q. 7573. And with regard to the other preservatives, if they were labeled that would meet your objection; is that your position generally?—A. No; I feel that the ideal condition of things would be to prohibit them all.

"Q. 7574. All preservatives?—A. All preservatives.

"Q. 7575. Even salt?—A. No; I am not speaking of substances which are normal constituents of the body.

"Q. 7576. Would you prohibit nitrate of potash, too?—A. One knows, even from smoking cigarettes, that nitrate of potash is not absolutely harmless."

The celebrated English physician, Sir Lauder Brunton, also gave strong testimony before the English Committee on this subject.

Following is his language:

"Moreover, it seems to me that by the unregulated use of preservatives we may possibly get a double danger, that from the drug itself which is used as a preservative, and that from the decomposing food which may in spite of the addition of a certain quantity of the preservative still undergo change and become dangerous to health."

He further says that he thinks it is desirable to absolutely exclude preservatives from milk. Sir Lauder was asked the following question:

"Q. 7431. Have you formed any opinion as to the relative harmlessness or value of the different chemical preservatives?—A.

I have formed an opinion, but the data upon which I have formed the opinion are so imperfect that I should prefer not to express any opinion."

And further on, in Q. 7432:

"We are unable to form opinions regarding the action of certain drugs from their administration, either to animals or to men, but the length of time over which such experiments extend is too short to allow of a complete opinion being formed in regard to their action."

In 7433, in answer to the question, "Do I understand that you mean the cumulative action of such a drug would not be thoroughly ascertained?" he replied:

"The cumulative action, and possibly something more than the cumulative action; that is to say, the continued action over a length of time, even though there should be no accumulation. To give an example of what I mean—if a man takes a little excess of sulphate of magnesia every morning, so as to cause rather too free purgation, there is no accumulation in the body of the sulphate of magnesia, but yet at the end of a year the continued excessive use of the drug has given rise to a condition of weakness which would not have been present but for this excessive use, and yet there has been no accumulation. I thus distinguish between the cumulative effect and a continued effect."

"Q. 7434. To take the example of one common preservative—boracic acid; the amount of boracic acid which can be voided by the human subject in the course of twenty-four hours is limited, is it not?—A. It is limited, but I do not know the limit.

"Q. 7435. That is one of the elements of uncertainty?—A. Yes; that is an element of uncertainty.

"Q. 7436. Although you might know the exact quantity being taken by a human being, it would be impossible to know whether there was any accumulation going on?—A. It would be difficult to know whether any accumulation was going on, and with the present data before us it would be impossible to say whether any continuous, as distinguished from a cumulative, effect was being produced.

"Q. 7460. Let us take, for instance, a physician who goes into a hospital and prescribes to a patient 10 or 15 grains of boracic acid three times a day; is it a matter of importance to the medical man and to the patient whether that patient may already be taking three times that amount?—A. Yes; I think it is.

"Q. 7461. A serious matter?—A. I think so.

"Q. 7462. And so with other drugs, such as salicylic acid and benzoic acid and other preservatives?—A. Yes."

I need not cite to you the results of our own experiments in this matter. They are so extensive that I could not even summarize them here. I may say, however, that we found all the chemical preservatives which we administered to our young men harmful. These included boric acid and borax, salicylic acid and salicylates, benzoic acid and benzoates, sulphurous acid and sulphites, formaldehyde and sulphate of copper.

One principal argument in favoring the use of any of these preservatives is that they are used only in small quantities, yet who is to be the judge of the quantity? The answer is always, the manufacturer. A "small quantity" is the maximum quantity that he wants to use, no difference what that may be, and he must necessarily use always more than the indicated amount to be certain of results. Should he use less than the amount necessary to kill all the ferments, the application of the preservative would be useless. Therefore it becomes a necessity always to use a sufficient quantity to be certain. The plea which is made by those who want to use preservatives for the privilege of using a minimum amount on the ground of its harmlessness is not an honest one. If the substance which they use is harmless, there seems to be no necessity for limiting the amount of it which they employ; if it is harmful it seems to be unwise to admit any of it into foods.

One of the gentlemen appearing before the committee stood squarely on logical grounds, and when he was discussing the proposition to so limit the power of the Secretary of Agriculture that he could not declare any preservative unwholesome unless it had been so declared by a special committee, Mr. Gardner, a member of Congress from Massachusetts, said in answer to a question by Judge Bartlett, of Georgia:

Mr. Gardner.—"I quite understand that, Judge. If you will read it over, however, I think you will see that it does not mean what the people who have introduced it perhaps think it does mean. At all events, I wish to appear and present my witnesses in behalf of the addition to the Hepburn bill of a paragraph which shall provide a minimum of this sort, and make it impossible for any commission, whether it shall be composed in such a way as was suggested by

Dr. Vaughan this morning or by the selection of the Secretary of Agriculture (in view of the fact that many people who have investigated those subjects are inclined to take a not altogether common-sense and practical view of this question), to prohibit the use of boracic acid, provided it does not appear in excess of one-half of 1 per cent.—the amount stated by Dr. Vaughan this morning as being harmless."

The position of Mr. Gardner is wholly logical if it be conceded that preservatives are necessary.

I also think it is easy to show that when experts testify that a given preservative is harmless they do so with a certain mental reservation. For instance, if a preservative is harmless, why should it not be put into all foods indiscriminately? What is the meaning of the word, "harmful" or "harmless"? I do not think that any one would say of a preservative that it would be harmful to every person who consumed it, but if it hurts one person, if it is injurious to a single individual, it becomes a harmful substance. If a man is indicted for larceny it is not sufficient to prove by a thousand people that he never stole anything from them. That has nothing to do with the case. But if it is proved in a single instance that he has stolen he becomes guilty. And so with the experts who testified before the Interstate and Foreign Commerce Committee—they negative their own arguments and statements by certain admissions respecting the harmfulness of the very bodies which they declare to be harmless. Dr. Vaughan particularly contradicted his own statements respecting the harmlessness of certain preservatives.

I said to the Committee, in reviewing Dr. Vaughan's testimony: "I believe it is recognized by everyone who has familiarized himself with the facts, that of all common food products milk is the most prone to decay. Doctor Vaughan himself has shown that by result of bacterial action in milk a poisonous substance, which he has called 'tyrotoxicon' is developed, which is very deadly in its effects.

During the summer months especially the newspapers are full of many cases of illness and death due to the consumption of ice cream.

"The rapidity with which bacteria multiply in fresh milk is something phenomenal. Therefore it seems reasonable to believe that if there could be any justification of the use of preservatives in food products it would be in milk. Doctor Vaughan's insistence on

the exclusion of every kind of preservative from milk, as I have already said, is certainly a confession that he believes these things are injurious. But it may be said in extenuation of this that milk is peculiarly the food of the infant. I do not desire to contradict that statement, which is doubtless true. But in what is the digestion of the infant different from the digestion of the adult? In no respect whatever except that of a mechanical difference. The infant is incapable of mastication. Therefore he cannot use solid food. Milk is a perfectly balanced food. It contains all the elements necessary to the sustenance of the body and in proportions best suited for nutrition.

"In case of illness among adults where digestion is disturbed, milk is a most reliable and common diet, since it is easiest digested. Therefore if preservatives interfere with digestion they would have a less harmful effect than on any other food product, because milk of itself is easiest of digestion.

"The process of metabolism in the infant is exactly that in the adult. Metabolism consists in the change of foods, first, into soluble forms and then the change in the character of these soluble forms by absorption into the system, and by utilization in building of tissues, and finally by degradation into excretion products. With the exception of the mechanical division of foods by mastication these two processes are absolutely identical in the infant and the adult.

"It follows, therefore, as a reliable and logical conclusion, that any added substance which renders milk deleterious would have the same effect on any other food in which it might be used."

The particular testimony of Dr. Vaughan to which I refer is found on page 65 of the hearings before the Interstate and Foreign Commerce Committee:—

"I am sure that benzoic acid in the quantities in which it is used in tomato catsup, sweet pickles, etc., one part to 1200 or 2000, does not do any harm. I should be opposed to the use of formaldehyde in milk in any quantity, or the use of any other preservatives in milk. I have testified repeatedly against the use of sulphite of soda on hamburger steaks."

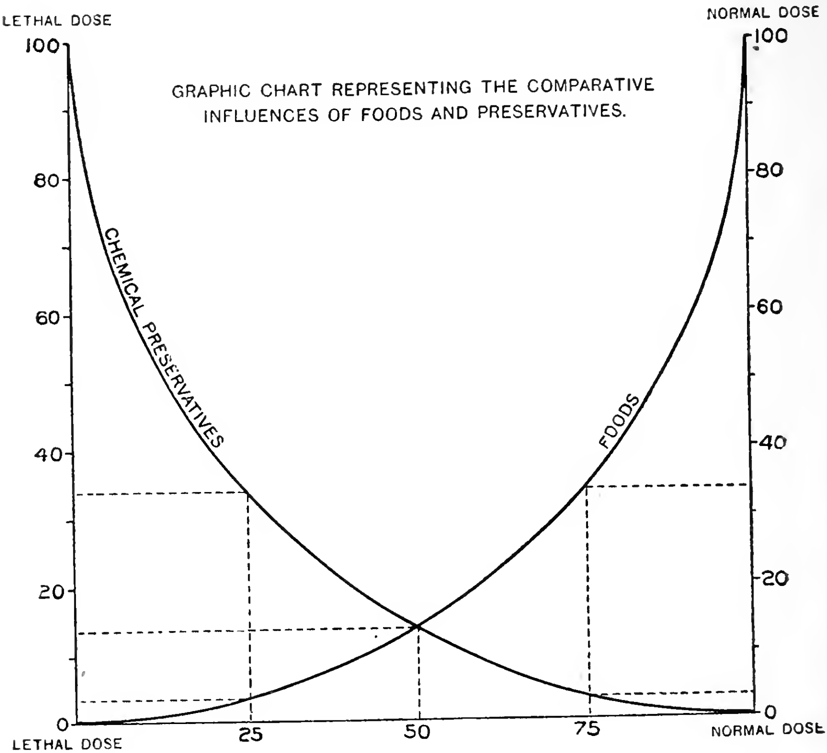
I should refer here again to Dr. Vaughan's testimony relating to the harmfulness of benzoic acid already quoted. If an expert of his experience is uncertain in regard to the harmfulness of two

grains of benzoic acid daily, instead of one grain, by what right of authority should he say that 0·5 per cent. of boric acid in foods is harmless and a greater amount harmful? Such a discrimination is neither logical, scientific nor hygienic. Yet it is upon such testimony it is asked that the authority of the Secretary of Agriculture to consult such experts as he deems advisable in respect of wholesomeness should be denied by an amendment to the food bill, and this matter be determined by a board of five experts appointed by the Secretary, one of whom shall be a physiological chemist, one a pharmacologist, one a bacteriologist, one a pathologist and one a toxicologist.

I cannot better answer the arguments which would indicate that a small quantity of a chemical substance may be used without producing harm than to refer to the chart (p. 166), which I presented to the Interstate and Foreign Commerce Committee. Simply because an effect is so small that it cannot be measured is no reason for denying its existence. Any given measurable quantity is made up of an infinite number of small quantities of the same kind. I believe that every expert will admit that there are certain quantities of chemical preservatives which are injurious, that is, which produce an effect which can be measured. They must also admit that the effect is the sum of an infinite number of small effects and that each of these infinitely small effects is produced by an infinitely small quantity of the preservative in question. We may, therefore, present this graphically as I do in this chart, in which I have compared the normal effects of foods and chemical preservatives by the construction of two curves intersecting each other above the median point of the base line.

We assume in the discussion of this chart that in a state of health no one needs a dose of any chemical preservative and, therefore, the normal dose of a chemical preservative is zero, as represented on the chart. We may represent the lethal dose of a chemical preservative by 100 and may assume three points to be measured on a curve, by means of which it may be constructed or plotted. In the same way we may construct a curve showing the effect of foods in a state of health, in which the normal dose is that which keeps the body in a state of equilibrium and may be represented by 100. The lethal dose of food is, of course, zero. Now it is evident that we cannot measure the infinitely small effect of an infinitely small dose of a

drug, which lies only at an infinitely small distance from zero to the left on the base line, but at the point 75 on the base line we are able to measure the effect of the drug. We can also measure it at the point 50 and at the point 25, and having determined these three points construct the theoretical curve. In the same way we cannot measure the effect of diminishing the normal dose of a food by an



infinitely small quantity, which would be at an infinitely small distance from 100 on the right, in descending toward the base line. We, however, could measure the effect of diminishing the food to the extent represented at the point 80 on the right, or at the point between 40 and 30, or at the point between 20 and 10 on the left, or between 10 and zero, which latter point would be absolute starvation. Thus it is wholly illogical and untrue to state that a small dose of a harmful substance produces no effect. It simply produces no effect

of a magnitude which may be measured, but by the application of the calculus we can determine the magnitude of the effect at an infinitely small distance from either the lethal or normal dose, both in the case of foods and of chemical preservatives.

Thus we have an absolutely irrefutable mathematical demonstration of the fact that even a small dose of a chemical preservative in a state of health is harmful. I am not unmindful of the fact, however, that practically every one of these chemical preservatives may become a useful medicine in pathological conditions, but this is no argument whatever for supposing that they are helpful in physiological conditions. Practically every one of the chemical preservatives adds a certain amount of labor to the excretory organs of the body. These organs have already all they ought to do in normal conditions and, therefore, to overload them even by a very small burden is illogical and unhygienic and must sooner or later lead to harm. In fact, I do not know of any more untenable argument in favor of the use of preservatives than the *argumentum de minimis*. From a medical point of view, too, the use of substances constantly in the food which are used as medicines is highly objectionable. The testimony of Sir Lauder Brunton before the English Departmental Committee is very pertinent and I quote it here, in answer to question 7464:

"Q. 7464. Then, with regard to the use of salicylic acid, may I just read you this: 'Sometimes, however, the salicyl compounds so irritate the kidneys as to cause albuminuria and even hæmaturia, and they must be used with great caution when given for this or other purposes if renal or hepatic disease be present, and in aged persons, inasmuch as under their influence there is an increase of the amount of uric acid waste and they are apparently not diuretic. The salicylates are believed by some authorities to be harmful in gout.' Assuming that, again, to be true, do you see in that an objection to the indiscriminate use of salicylic acid?—A. To the indiscriminate use, certainly; and that, I think, affords a very strong proof of the correctness of my suggestion that preservatives should not be allowed to be used without the person who is using them knowing that he was taking them, because in the great majority of cases salicylic acid will not produce those symptoms, but there are certain individuals who might be thus affected. If salicylic acid is allowed to be used without its use being notified to the consumer

he may be suffering from those symptoms while he himself and his medical man are totally in the dark in regard to the cause of the symptoms, whereas if he is notified that the milk or other food which he is taking contains a certain proportion of salicylic acid the attention of the medical man would probably be at once directed to the possibility of salicylic acid having been the cause of the symptoms."

The above extract from the testimony before the Departmental Committee it seems to me covers the whole ground in a nutshell. The reason that Sir Lauder Brunton is in favor of labeling foods which contain preservatives is to enable the medical men in cases of disease to ascertain what the causes of this disease have been. Certainly a more sweeping statement respecting the harmful quality of preservatives cannot be found in medical literature and this opinion of his commends itself strongly to the medical fraternity.

I have briefly summarized the present state of the question touching the use of preservatives in foods. I have not mentioned, however, the rights of that vast majority of consumers who desire that their foods shall not be treated with any chemical antiseptic of any description. The rights of the consumer, in my opinion, are paramount to those of trade, and the people of this country who desire to eat their foods without chemical antiseptics surely ought to have the privilege of doing so. The proposition, it seems to me, has become a purely ethical one. It is simply this: On the one hand, shall a few men engaged in the manufacture of food products, in order that they may increase their profits by a small sum, be permitted to use upon foods which enter into common consumption chemical preservatives which the great mass of the people will either have to eat or do without the articles in question? On the other hand, shall the rights of the great mass of consumers be conserved so that in the purchase of food products they may be certain that they do not contain any drugs or chemicals and that they are pure and wholesome?

We have now in this country a wave of ethical reform which I hope may not recede for a long time. The people are awakened to a sense of their rights and also to a conception of the frauds of every description which have been so persistently practised upon them. No one will deny any citizen the right to use such chemical preservatives as he pleases in his own food. He can have salt-cel-

lars filled with the whole list of preservatives upon his table and use them to his heart's content, but the day I think has passed when the food manufacturer may with impunity place in his goods the very substances which the physician can use only after years of study and after passing an examination, and which the druggist cannot sell without a physician's prescription. The people have rights and they will dare assert them, and the greed of gold and the concupiscence of trade must give way to the broad ethical principle which forbids the use of drugs in foods.

"Or what man is there of you, whom if his son ask bread, will he give him a"—drug?

LIQOUR CRESOLIS COMPOSITUS.

By Charles H. LaWall and E. Fullerton Cook.

The use of crude carbolic acid of the Pharmacopœia of 1890 in preference to the purified phenol for general disinfecting purposes was not based alone upon economic reasons, but was due to the fact that the so-called crude carbolic acid was in reality not carbolic acid at all, but that it consisted mainly of homologues having more energetic properties than the phenol itself, namely the cresols.

The recognition of this fact was quickly taken advantage of by manufacturers of proprietary disinfectant and antiseptic solutions. The cresols were separated by fractionation, the three homologues being combined in the one liquid, known under the trade name "Cresol," and as the physical properties were dissimilar from phenol in the fact that cresol is almost insoluble in water, preparations were devised to overcome this difficulty by combining the cresol with some form of soap, which combination was found to be the most advantageous method of using it.

The widespread popular use of some of these preparations led the Revision Committee of the Eighth Revision of the U. S. P. to include cresol in the list of medicinal substances, and to give a formula for a soluble preparation of the same.

Several complaints having reached the ears of the authors of this paper, both as to the quality of the commercial cresol on the market and the practicability of the working process for the compound solution, it was considered worthy of a little experimentation as to the facts in the case.

Seven samples of cresol were obtained from various sources, representing articles of German, English and American manufacture. These were examined as to the boiling point, specific gravity, and solubility, after which samples of the compound solution were made from each one of them and the properties compared.

The Pharmacopœial requirements on these points are as follows: Boiling point 195 to 205° C.; specific gravity 1·032 at 25° C.; soluble in 60 parts of water at 25° C. A sample of crude carbolic acid was included in the list for purposes of comparison (see No. 4).

Sample.	Specific Gravity.	Boiling Point.	Solubility.
1.	1·032	197–203 C.	1–70
2.	1·037	192–201 C.	1–60
3.	1·045	194–201 C.	1–60
4.	0·979	188–268 C.	insoluble
5. Amer.	1·0383	194–203 C.	1–60
6. Eng.	1·0363	194–203 C.	1–80
7. Ger.	1·0316	195–204 C.	1–100

These figures indicate that so far as the boiling point is concerned, all of the samples are very close to the U. S. P. requirements, but that as regards solubility and specific gravity there is quite a variation from the official figures. This variation may in part be due to the varying proportions of the three isomers which go to make up the official substance.

In connection with the test for solubility it was noticed that not one of the samples made a perfectly bright clear solution, but that all contained varying proportions of a flocculent material which was not dissolved even after the addition of a large excess of water and standing for some time. The point of complete solubility was therefore taken as the point when there was neither a milky turbidity nor the separation of oily drops. All of the cresol samples answered the U. S. P. requirements for absence of hydrocarbon oil by being perfectly soluble in sodium hydroxide solution.

The consideration of the solutions was then taken up, and samples of the solution were made up according to the U. S. P. directions from Nos. 1 and 2. It was noticed that a preparation was afforded which was not immediately soluble in water, and which did not acquire solubility even after a few hours standing as stated in the official process. The sample was therefore allowed to stand and was tested at intervals to ascertain the length of time that

would be required for the completion of the reaction, if one there was, and it was found that the sample which was at first quite turbid and which made a very milky mixture when poured into water, became gradually clearer, and produced less and less milkiness when added to water, but that the time for the completion of the preparation was three weeks. Another experiment was made later, again testing from day to day, and it was found that this time it required two weeks and five days for the production of a soluble preparation.

Samples of the solution were then made up, using the official proportions of all of the ingredients, but altering the working formula so as to complete the reaction between the linseed oil and the potassium hydroxide before adding the cresol.

This modification of the formula was found to answer perfectly for producing a preparation which is transparent as soon as completed, and which mixes clear with all proportions of water without any delay whatever. The actual working process is as follows:—

A soft soap is first prepared, using the same amounts of linseed oil and potassium hydroxide as directed for the preparation of the official compound solution of cresol. The details of the process, on the small scale may be the same as that directed for the U. S. P. soft soap.

Heat the linseed oil (350 grammes) in a deep capacious vessel, on a water bath, to a temperature of about 70° C. Dissolve the potassium hydroxide (80 grammes) in 450 cc. of water, warm the solution to about 70° C., add it to the linseed oil and mix thoroughly. Then incorporate 40 cc. of alcohol and continue the heat without stirring until a small portion of the mixture is found to be soluble in boiling water without the separation of oily drops. The soap, thus prepared, is now dissolved in 500 grammes of cresol and a sufficient quantity of water added to make the solution weigh 1000 grammes.

This solution may be immediately mixed with water, in any proportion, forming a clear liquid, and will correspond with the official solution in strength and content.

Other suggestions have been made for the extemporaneous preparation of this solution, such as the replacing of the linseed oil by a more readily saponifiable oil, as cotton-seed oil, but as this would modify the preparation to the extent of changing the soap and

lightening it in color, it could not replace the official solution when that is prescribed. Such a modification might be made to advantage when the official solution is not required.

The amount of soap used in the official solution seems to be needlessly large, two thirds of the amount directed has given equally satisfactory results.

Care should be taken to avoid heating the liquid after the cresol has been added, since it is quite volatile and the vapor is inflammable.

LONDON BOTANIC GARDENS.

By Pierre Élie Félix Perrédès, B.Sc., F.L.S.,
Pharmaceutical Chemist.
A Contribution from the Wellcome Research Laboratories, London.

(*Continued from p. 121.*)

IV.

THE CHELSEA PHYSIC GARDEN.

Before commencing an account of the Chelsea Physic Garden, it will be necessary to give a brief *résumé* of the origin and development of the society by which the garden was founded. The Society of Apothecaries of London—in Latin, "*Societas Pharmacopœiorum Londinensis,*" or "*Societas Pharmaceutica Londinensis*"—was incorporated by Royal Charter in 1606, and was then united with the Grocers' Company, an ancient City guild. The existence of the Society as an independent body dates from 1617, when a new charter was obtained from James I, and the Society severed its connection with the Grocers' Company.

The Society of Apothecaries, or "*Societas Pharmaceutica Londinensis,*" must not be confounded with the Pharmaceutical Society of Great Britain, the latter having been established in 1841, incorporated by Royal Charter in 1843, and made, by the Pharmacy Acts of 1852 and 1868, the only legal body in the United Kingdom for the examination and registration of pharmacists. It may seem strange to the American reader that the title of "apothecary" should not be synonymous with that of "pharmacist," and in order to explain this apparent anomaly, we must go back to an early date in the history of the Society of Apothecaries. The "apothecary," at the time of the Society's inception, and for a considerable period

STUDENTS' ENTRANCE TO THE CHELSEA PHYSIC GARDEN, IN SWAN WALK.

thereafter, was nothing more nor less than a compounder of drugs, or dispenser, and the term is still used in this sense in the United States. By the end of the seventeenth century, however, the practice of prescribing drugs as well as that of dispensing them had been assumed by the apothecary, and by a decision of the House of Lords, in 1703, it was definitely settled that the directing and ordering of remedies was, no less than their preparation, a legimate part of the apothecaries' functions. The powers of the Society of Apothecaries were further extended by the Acts of 1748 and 1815, which restricted the practice of the apothecary's art to such as were duly licensed by the Society. These restrictions only applied to London and its environs at first, but, by the latter Act, were made to comprise the whole of England and Wales. By these two Acts the Society was also empowered to appoint a board of examiners, and it is a significant fact that our existing medical schools are, in a great measure, the outcome of the evidence of training required from candidates by this board. The Society has, indeed, been a pioneer in the cause of education on more than one occasion, and, in 1850, it imposed a preliminary examination in arts on its prospective licentiates. This examination may be looked upon as the forerunner of the preliminary knowledge in arts that is now essential for registration as a medical student in the British Isles. By the Medical Acts of 1858 and 1886, the licentiateship of the Society of Apothecaries was recognized as a complete legal qualification for the practice of medicine, surgery and midwifery throughout the United Kingdom and Ireland. In the early days of the Society's existence the knowledge of the "art and mystery" of the apothecary was acquired through apprenticeship, and it is on record that the Society examined its apprentices as early as 1619; by the Act of 1815 a five years' apprenticeship to an apothecary was made obligatory on every candidate for the license, but this restriction was removed by the Apothecaries' Act Amendment Act of 1874, and apprenticeship is now no longer necessary.

In addition to the licentiateship, the Society of Apothecaries grants a dispenser's certificate, but this is of limited value, as it practically restricts its possessor to the work of dispensing for medical men; the Pharmacy Acts cited above making it unlawful for any person not registered under those Acts "to sell or keep open shop for retailing, dispensing or compounding poisons," or to assume the

name of "pharmacist," "chemist" or "druggist." The "apothecary" himself, however, that is to say, the *licentiate* of the Society of Apothecaries, is free to practise pharmacy if he be so disposed, as the penalties imposed on persons who are not registered under the Pharmacy Acts do not apply to medical practitioners.[1] The Society of Apothecaries, as a matter of fact, conducts an open pharmacy of its own at its hall in the vicinity of St. Paul's Cathedral. In connection with this section of the Society's work, it is of interest to note that a laboratory for the preparation of drugs was erected in 1671, and that a "selling place" existed in 1672, as shown by the Society's records. Drugs were only sold to apothecaries at first, but as time went on the Society developed an extensive business with the East India Company and other bodies, and, finally, the retail department was opened in 1822.[2]

We will now proceed to consider in greater detail the activities of the Society in promoting the study of botany, as exemplified more especially by the establishment of the Physic Garden at Chelsea and by the maintenance of the latter during two and a quarter centuries.

It is on record that the members of the Society of Apothecaries interested themselves in botanical pursuits soon after their incorporation, and that they made periodical excursions in search of plants early in the seventeenth century. We are indebted to Thomas Johnson, editor of Gerarde's Herbal, and one of the Society's members, for several accounts of these early "Herbarizings" as they came to be called. By 1633 an annual General Herborizing was definitely instituted,[3] while other less formal ones were also undertaken from time to time.

---

[1] To this brief explanation of the status of the licentiate of the Society of Apothecaries, it is necessary to add a few particulars in order to give an exact presentation of the facts. The diploma of "Licentiate of the Society of Apothecaries" does not of itself authorize its possessor to act as a medical practitioner, but it entitles him, in common with the holders of other degrees and qualifications in medicine and surgery, to have his name placed on the British Medical Register, on payment of the requisite fees. The person so registered becomes, *ipso facto*, a legally recognized medical practitioner, to whom the above-mentioned provisions of the Pharmacy Acts do not apply.

[2] Those interested in the history of the Society may consult Mr. Barrett's "History of the Society of Apothecaries of London" for further particulars.

[3] According to Pulteney ("Historical and Biographical Sketches of the Progress of Botany in England," London, 1790) these annual Herborizings were subsequently discontinued for many years, but were systematically renewed after the foundation of the garden.

The annual excursions were confined to the members of the Society and their friends, and those who participated in them were known as "Socii Itinerantes." From Johnson's account of these excursions we learn that the itinerant members used to travel considerable distances, sometimes going as far afield as Anglesea or Bath. The number of members taking part in the excursions appears to have dwindled as time went on, and the task of collecting plants for the General Herborizing came to be associated with the duty of the Society's Demonstrator of Plants. This is made apparent by the following abstract from the instructions issued in 1773 by the Garden Committee, in connection with the office of Demonstrator of Plants:—"He [*i. e.*, the Demonstrator of Plants] is expected to make some annual excursion, for two days at least, preparatory to the Society's General Herborizing, inviting two or three of the ablest botanical members to his assistance. The intention being to collect such vegetables as are not commonly found in the environs of the metropolis, to be demonstrated by him at the meeting appointed for that purpose . . . ." The plants thus collected were exhibited to the members on a day specially appointed for the purpose in July. The office-bearers of the Royal Colleges of Physicians and Surgeons were invited to these exhibitions, which were held, until 1836, at some inn in the suburbs. At this function the Demonstrator gave to the assembled guests a description of the specimens collected and the demonstration was followed by a dinner where "haunches of venison formed conspicuous elements of the entertainment." With the advent of Lindley as Professor of Botany and *Præfectus Horti*, in 1836, the practice was inaugurated of holding the annual exhibition of plants and General Herborizing at the Society's hall instead of at an inn. When the office of Professor of Botany and *Præfectus Horti* was abolished in 1853 the annual exhibition inevitably disappeared with it,[1] although the dinner was continued.

The other herborizings to which allusion has been made were designed to meet the needs of the Society's apprentices. Five of these in each year were ultimately established, viz., two in May, one

[1] It is reasonable to assume that these botanical demonstrations were kept up during the whole period of Lindley's tenure of office, as there is no record of his rôle having been modified in this direction. I have, however, been unable to find any overt indication of the fact.

in June, one in July, and one in August, but there are no means of determining the exact period at which a definite series of these students' herborizings was instituted. It is apparent, however, that the organization of these excursions cannot have been far removed from the creation of the office of Demonstrator of Plants, and the duties of that functionary at these herborizings were defined in the previously mentioned instructions of 1773 as follows:—"He is to accompany and conduct the students of this Society in their search after indigenous plants, upon every day appointed for their private Herborizings, which are only five in each summer; when he is desired to use his best endeavors to preserve strict decorum among his pupils, and for directing and confining their attention solely to the intended business of the day." The details of the excursions are of the greatest interest, but we must needs content ourselves with a brief description of their salient features. These excursions invariably took place in the neighborhood of London, and were of one day's duration. The students met the demonstrator early in the morning at some place previously decided upon, and the members of the party, provided with their collecting boxes, set out on their journey through the suburbs, collecting plants on the way, and halting for breakfast at some inn. The business of the day then began in earnest, and the students, accompanied by the demonstrator, collected specimens and made observations. The route was varied on different occasions, the party sometimes returning to the breakfasting place, at other times proceeding further afield, but whatever the route might be, dinner at an inn was always provided at the end of the journey. At the conclusion of the meal the demonstrator described the peculiarities of the specimens which he had collected, before the student audience, laying special stress on the therapeutical properties of such plants as were used in medicine. Tea then followed and the gathering dispersed for home, the students usually accomplishing the return journey on foot. These students' herborizings appear to have been continued uninterruptedly until 1834, but they were abolished in the following year, owing chiefly to the ever-increasing extension of the metropolitan area and consequent inaccessibility of suitable localities for field work in botany.

Coming now to the garden itself, we find ourselves confronted with a mass of detail which renders a subdivision of the subject-matter desirable in order to give some continuity to the account

The administrative and material details may conveniently be considered first, and we shall accordingly begin with these; a *résumé* of the botanical work accomplished in connection with the garden will then be given; and the whole account will be concluded by a general description of the garden under the present administration.

The ground now occupied by the Chelsea Physic Garden was originally leased from Charles Cheyne by the Society of Apothecaries in 1673 for a term of sixty-one years. The immediate object which the Society's members had in view in taking this lease was the acquisition of a suitable spot near the river for the erection of a barge-house, as it was customary for the City companies at that time to possess a state barge for participation in the Lord Mayor's show and similar functions. The plot of ground thus acquired was nearly four acres in extent, so that a part of it was utilized by the proprietors of the Laboratory Stock for growing medicinal herbs, and plants were transferred to it from the Society's garden at Westminster.[1] A wall was built around the Chelsea Garden in 1674 at the expense of fourteen of the Society's members, on the understanding that the Court of Assistants would contribute £2 every year forever to each of the six herborizings. A sum of £50 was also contributed towards the cost of this wall by the proprietors of the Laboratory Stock in return for the privilege given to them of growing herbs for their own use in the garden. A gardener must have been employed very soon after the garden was established, for it is recorded that a man named Piggott, who had served in that capacity, was dismissed in 1677. Richard Pratt was chosen in his stead, and a lodging was provided for him in addition to his salary. In 1679 the first committee of management, consisting of the extraordinary number of seventy-one persons, was appointed, and, in 1680, John Watts, a member of the Society, and one of the fourteen contributors to the cost of the wall, was elected gardener, with "the allowance of one or two laborers" besides his salary. A "stove" was erected in the following year in the lower part of the garden, near the river, and, in 1683, four young cedars of Lebanon, the first grown in this coun-

[1] Little is known of this garden, but it is evident, from an entry in Evelyn's Diary, that a Physic Garden was in existence at Westminster in the middle of the seventeenth century. It is also evident that the Society subsequently became connected with it in some way, for an arrangement was made in 1676 for removing the plants from thence to the Chelsea Garden.

try, were planted. (For the positions which they occupied see "9" on Plate XXV). Two of the trees died after about a century's existence, and were cut down (1771); of the remaining two (see Plate XXIII), one died in 1875, and the other was removed in 1904.[1] By 1685 the expenses of the garden began to assume such considerable proportions that a plan was adopted in that year by which the entire management of the garden was handed over to Watts for seven years, on the condition that the garden and the buildings therein were to be kept in good order and that a catalogue of all the plants was to be prepared. He was allowed an annual sum for these services, in addition to all expenses incurred in cultivating the ground used by the proprietors of the Laboratory Stock. Each member of the Society was allowed a key of the garden at his own expense.

It was during the first year of Watt's lease that Evelyn visited the garden, and it will not be without interest to reproduce his entry, as it gives us some insight into the condition of the garden at that date (1685):—

"7 Aug. I went to see Mr. Wats, keeper of the Apothecaries Garden of Simples at Chelsea, where there is a collection of innumerable rarities of that sort particularly, besides many annuals, the tree bearing jesuits bark, which had don such wonders in quartan agues. What was very ingenious was the subterranean heate, conveyed by a stove under the conservatory, which was all vaulted with brick, so as he has the doores and windowes open in the hardest frosts, secluding only the snow."[2]

After the expiration of Watt's lease in 1693, Samuel Doody, F.R.S., also a member of the Society, took over the charge and management of the garden on terms similar to those previously made with Watts. This arrangement, however, soon proved unsatisfactory and Doody was absolved from his obligations in 1695; but it is nevertheless probable that he continued to manage the affairs of the garden until his death in 1706. After Doody's decease the

[1] A limb was blown off in 1812 from one of these cedars, and from it a chair was made. In 1846 another limb was broken off in the same way, but whether from the same tree or not, is not stated, and from this *four* chairs were made.

[2] Textually rendered from Bray's edition of the Diary. The abstract previously given in the introductory chapter was taken from the emended version in Field's work (see AMERICAN JOURNAL OF PHARMACY, October, 1905, p. 454).

Chelsea Physic Garden (*circa* 1850) from the River, before the construction of the Chelsea Embankment.

relinquishment of the garden was seriously contemplated, but a committee, which was specially appointed to decide the question, resolved upon its retention; and an arrangement was made in 1708 by which the garden was leased to such members of the Society as chose to subscribe a sum of £100 per annum among themselves towards the upkeep of the garden. This utterly unworkable scheme had to be abandoned before long, and, in 1713, definite fees were imposed on the Society's constituents. In 1714 it was decided that, for the time being, the garden should be maintained by the Corporation.[1] From this date until 1722 the affairs of the garden were in a somewhat unsettled condition, and the gardener or gardeners employed were evidently unimportant officials, as there is no gardener mentioned by name in the Society's records during that period. The decrease in importance of the post of gardener was accompanied by a correspondingly increased importance in that of Demonstrator of Plants. We have already seen that John Petiver, F.R.S., officiated in the latter capacity in 1709, and although it is more than probable that he had occupied the post for some time previously, the circumstances connected with the garden at this time were undoubtedly such as to bring him in close contact with its affairs, and to pave the way for the step which was taken in 1724 of entrusting the direction of the garden to his successors in office. In 1712 Dr. Hans Sloane[2] purchased the manor of Chelsea from

---

[1] The term "the Corporation" has been used, throughout this chapter, to denote the Society of Apothecaries of London, in its capacity as a corporate body. This explanation is rendered necessary by the fact that the Corporation of the *City* of London is generally known as "The Corporation."

[2] Hans Sloane was born in Ireland in 1660, of Scotch parents. He went to London about his nineteenth year to study medicine, and while there he came into contact with Ray the naturalist. This association was instrumental in developing his taste for botanical subjects, and during his subsequent stay in Paris in 1683 he attended lectures on botany by Tournefort, as well as on anatomy by Duverney. After leaving Paris Sloane went to Montpelier where he became acquainted with the celebrities of its University and commenced his collection of plants. After travelling in Languedoc to increase his collection, he returned to London in 1684. He was elected a Fellow of the Royal Society in 1685, and a Fellow of the Royal College of Physicians in 1687. In the latter year he accompanied the Duke of Albermarle to Jamaica, where he further enriched his collection by the addition of a number of tropical plants. After an absence of fifteen months Sloane returned to London; became Physician to Christ's Hospital in 1694; married the daughter of a wealthy alderman in 1695; became Secretary of the

William, Lord Cheyne, and, as the Society's garden formed part of this estate, a deputation from the Society waited upon its new owner in 1714 to confer with him respecting the affairs of the garden. The immediate result of this conference is not known, but it can be safely surmised that the events which we are about to describe were the ultimate outcome of the interview. A second conference with Sir Hans Sloane took place in 1718, in which the affairs of the garden were again discussed, and within a few weeks after the event Sir Hans Sloane intimated that he was prepared to transfer the property to the Society on certain conditions. In conformity with his promise he conveyed the garden to the Apothecaries' Society by deed in 1722. It was stated in this deed that the conveyance was made "to the end that the said garden might at all times thereafter be continued as a physick garden, and for the better encouraging and enabling the said Society to support the charge thereof, for the manifestation of the power, wisdom, and glory of God in the works of the creation, and that their Apprentices and others might better distinguish good and useful plants from those that bore resemblance to them, and yet were hurtful, and other the like good purposes."[1] These objects had already been aimed at by the Society, but the garden had also been utilized up to this time for the cultivation of medicinal plants to be converted into drugs for the Society's use. By the present deed the latter practice was prohibited. Among the other important conditions of the grant were the fol-

---

Royal Society in 1693, a vice-president in 1712, and president in 1727; was created a baronet in 1716; became president of the Royal College of Physicians in 1719; and was appointed Physician to the King in 1727. Sir Hans Sloane continued as president of the College of Physicians until 1735, and died in 1753. At his death his collections of plants and other objects of Natural History, together with his library and MSS., were purchased by the nation for £20,000. These collections formed the nucleus of the British Museum, opened in 1759. Sloane was the author of a work entitled the "Natural History of Jamaica," in which he adopted the classification of Ray. He also contributed several papers to the "Philosophical Transactions." Sloane had four children; two of these, both daughters, "survived their parents, and carried their wealth to the noble families of Stanley and Cadogan." For a critical estimate of this remarkable man, who was at once a fashionable physician and scientific dilettante, see "Encyclop. Brit.," 9th Ed., Vol. XXII, p. 160.

[1] This passage, although placed in inverted commas, has, for convenience, been transferred from the present to the past tense.

lowing :—£5 per annum were to be paid to Sir Hans Sloane or his heirs forever; "fifty specimens of distinct plants, well dried and preserved, which grew in their garden the same year, with their names or reputed names," were to be delivered yearly to the "President, Council and Fellows of the Royal Society of London" until the number of two thousand had been attained, and "those presented in each year" were "to be specifically different from [those of] every former year;" no other buildings but those legitimately connected with a physic garden were to be erected, but the barge-house was allowed to remain. In the case of non-fulfilment of these conditions by the Society of Apothecaries, Sir Hans Sloane or his heirs were empowered to enter into possession of the garden and to hold it in trust for the benefit of the Royal Society, or, failing this, of the Royal College of Physicians, on conditions similar to those imposed on the Society of Apothecaries. Power was also reserved for the President and Vice-President of the Royal Society and of the Royal College of Physicians to visit the garden "once or oftener in every year" to ascertain whether the conditions specified were "duly observed and complied with" by the Society of Apothecaries. These conditions have, on the whole, been faithfully complied with by the Society, but payment of the annual rent does not appear to have been enforced by either Sir Hans Sloane or his heirs. The annual delivery of plants to the Royal Society seems to have taken place at irregular intervals, but the condition as to number was more than fulfilled, for with the last presentation, in 1794, a total of (at least) 2550 specimens had been attained.

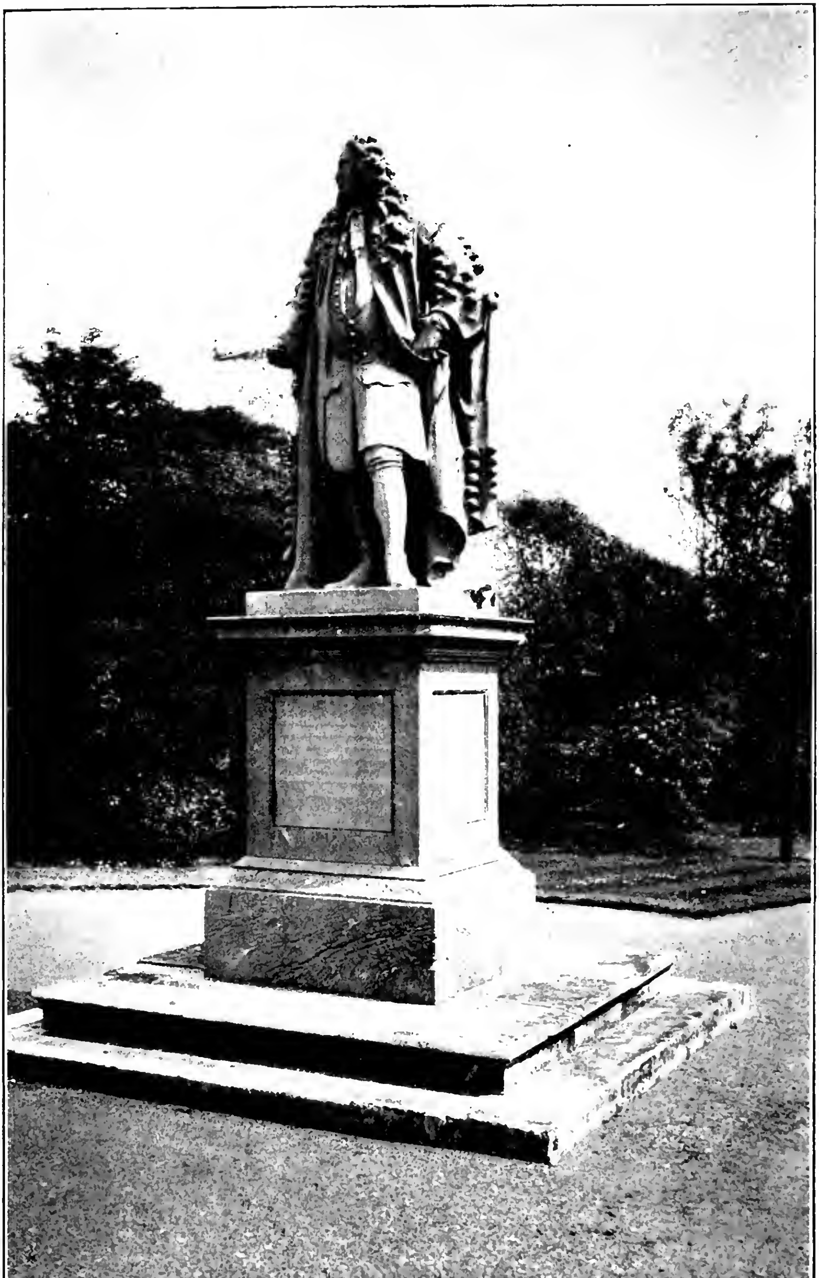
The members of the Society having come into permanent possession of the garden, they directed their energies toward its reorganization. A committee was appointed for the purpose of administration, and, on the recommendation of the committee, the gardener then in charge was dismissed[1] and Philip Miller chosen in his place. The post which the latter so honorably filled was occupied uninterruptedly until 1887 by the following in succession: Philip Miller, F.R.S. (1722–1770); William Forsyth, F.L.S. (1770–1784); John

[1] Tradition had it that he was Philip Miller's own father, but Mr. Barrett has discovered an entry in the Society's records giving his name as Charles Gardiner. Henry Field, writing in 1820, made the statement that the records of the Society were silent upon the subject.

Fairbairn (1784–1814); William Anderson, F.L.S. (1814–1846); Robert Fortune (1846–1848); Thomas Moore, F.L.S. (1848–1887). The title of "Gardener" was changed to that of "Curator" during William Anderson's term of office.

The funds necessary for the re-arrangement of the garden and the repair of the buildings which it contained were raised by means of fees imposed upon the freemen of the Society and by an annual grant from its corporate funds, while the Royal College of Physicians assisted with a gift of £100. In 1724, on the recommendation of the Garden Committee, the Demonstrator of Plants, Isaac Rand, F.R.S., was appointed Director of the Garden or *Præfectus Horti*, his duty in the latter capacity consisting in the superintendence and frequent inspection of the garden, while as demonstrator he was required "to attend in the garden during the six summer months, at least twice in each month, to demonstrate the plants to such as should then attend, and to execute such other matters as were by former orders enjoined." This office, like that of the gardener or curator, was held uninterruptedly for a considerable period, and the following filled the post in succession until its abolition in 1853: Isaac Rand, F.R.S. (to 1743); Joseph Miller (1743–1747); John Wilmer (1748–1764); William Hudson, F.R.S. (1765–1771); Stanesby Alchorne (Honorary) (1771–1772); William Curtis, F.L.S. (1773–1777); Thomas Wheeler, F.L.S. (1778–1820); James Lowe Wheeler (1821–1834); Gilbert Thomas Burnett, F.L.S. (1835); John Lindley, F.R.S. (1835–1853). James Lowe Wheeler was the first Demonstrator of Plants to whom the title of "Professor of Botany" was applied, but the terms "Professor" and "Demonstrator" were for some time used conjointly.

In 1732 important additions to the equipment of the garden were begun. These additions, consisting of a greenhouse and two stoves (see "1," "2," and "3," Plate XXV), were completed within two years; the expenses incurred in the undertaking were met by subscription among the members of the Society, and by a contribution from the Corporation. The first stone was laid by Sir Hans Sloane, and, in the following year, it was decided to erect a statue of him in the garden. This statue, the work of Michael Rysbrach, was completed in 1737 and placed in a niche in the front wall of the greenhouse. It was removed in 1748 to the position it now occupies in the centre of the garden and placed upon a pedestal



Statue of Sir Hans Sloane, in the Chelsea Physic Garden.

which, like the statue itself, is of marble (see Plate XXIV). The following inscriptions were engraved on the pedestal in 1751 :[1]

HANS: SLOANE Bar: Archiatro
Insignissimo Botanices Fautori
Hoc honoris causa Monimentum.
Inque perpetuam ejus memoriam.
Sacrum voluit
Societas Pharmacopœior: Londinens:
MDCCXXXIII.

THEY
Being Sensible how necessary
that Branch of Science is
to the faithful discharging the Duty
of their Profession,
With grateful Hearts
and general Consent
Ordered *this* Statue *to be Erected*
In the year of our Lord 1733,
That their Successors and Posterity
may never forget
their Common Benefactor.

Placed here in the Year 1737.
Sr. Benjamin Rawling, Knt. *Master*
Mr. Joseph Miller } *Wardens.*
Mr. Joseph Richards }

(*To be continued.*)

U. S. PHARMACOPŒIAL BUSINESS AFFAIRS.

The Board of Trustees met at Pittsburg, December 2d. Members J. H. Beal, A. E. Ebert, J. P. Remington, S. A. D. Sheppard, and H. M. Whelpley were present. Horatio C. Wood was absent. Secretary Murray Galt Motter has issued to the members the official minutes of the proceedings. A resumé of the work of the Committee of Revision to be published in convenient form was discussed, but no definite action taken by the trustees.

[1] According to Barrett the Latin inscription which was to be cut on the statue of Sir Hans Sloane was finally decided upon on August 22, 1771, and its terms are inserted in the minute-book in full.

An edition of the Pharmacopœia in the Spanish language will, no doubt, be one result of the recent meeting. A committee consisting of Professor J. P. Remington, Chairman of the Committee of Revision; Charles E. Dohme, Chairman of Board of Trustees; and Dr. H. C. Wood, President U.S.P. Convention, was appointed to make the preliminary arrangements for an edition of 2,000 copies. The discussion developed the fact that great interest is being taken in the proposition.

Dr. Walter Wyman, Surgeon-General of the Marine Hospital and Public Health Service, was tendered a special vote of thanks for the publication of Bulletin No. 23 entitled, "Changes in the Pharmacopœia of the U. S. of A., Eighth Revision." Also, for the bulletin on Standardization of Diphtheria Antitoxins. A vote of thanks was also tendered Dr. Reid Hunt and Dr. Murray Galt Motter, of the Service, for their work on Bulletin No. 23.

With a view of bringing the Pharmacopœia to the direct attention of medical students, it was decided to present the professors of materia medica in the medical colleges with complimentary copies of the Pharmacopœia. The recipients of such copies will be requested to call the students' special attention to the purpose of the Pharmacopœia and the nature of official remedies.

The extent of additional honoraria to members of the committee of revision was considered at length, but action postponed until the next meeting of the board.

Several applications from publishers who desire to use portions of the text of the U.S.P. were discussed and the rate of compensation decided upon.

The Board adjourned to meet at the new Willard Hotel, Washington, D. C., January 20, 1906.

The Pittsburg College of Pharmacy tendered the Board of Trustees an informal dinner.

HENRY M. WHELPLEY, *Secretary*,
U. S. Pharmacopœial Convention.

NORTH CAROLINA BOARD OF PHARMACY.

At a meeting of the North Carolina Board of Pharmacy, held in Raleigh, N. C., on November 21, 1905, the following resolutions were unanimously adopted:

Resolved, That it is the sense and ruling of this Board for the purpose of allowing for attendance in reputable schools and colleges of Pharmacy as part of the three years' experience required in Pharmacy of applicants for license, that such institutions shall:—

(1) Be incorporated as a college or school of pharmacy, or be a department of a regularly incorporated educational institution, or a department of a State University, or conducted by an incorporated pharmaceutical society.

(2) That the institution shall include in its courses of instruction oral lectures, personal laboratory work, recitations and reviews. This shall exclude work in absentia.

(3) That the institution shall require of each candidate for graduation not less than 500 hours given to lectures and recitations, and not less than 600 hours of laboratory work, such work to be given in a period of not less than forty weeks.

F. W. Hancock,
Secretary and Treasurer.

ILLINOIS BOARD OF PHARMACY.

Extract from the report of the special committee on the address of the President of the Illinois Pharmaceutical Association at the annual meeting in August, 1905. Adopted by the association without a dissenting vote:

"The objects of the Illinois Pharmaceutical Association as expressed in the Constitution being to promote the advancement of pharmacy and of those engaged in its practice to a higher professional standing, the support and encouragement of education and a more thorough preliminary schooling and greater scientific requirements for the practice of pharmacy. Therefore your committee believes that at this time action should be taken to place Illinois abreast of New York and Pennsylvania in the thoroughness of the pharmaceutical training demanded by law."

Resolution presented by Prof. W. B. Day at the August meeting of the Illinois Pharmaceutical Association and unanimously adopted:

"Whereas, The object of all Pharmaceutical legislation is to promote sufficient special training for pharmacy, and

"Whereas, The progress of medical science carries with it greater demands upon the pharmacist than ever before, and

"WHEREAS, The recent pharmacopœias of all countries require more extended technical education for their proper interpretation and observance, and

"WHEREAS, In view of these considerations, the States of New York, Pennsylvania, Wisconsin, Ohio and South Dakota have already advanced the educational requirements for registration in pharmacy beyond the existing requirements in Illinois; therefore, by the Illinois Pharmaceutical Association be it

"*Resolved*, That the Board of Pharmacy of Illinois be requested to take such action toward increasing the requirements for the registration of registered pharmacists, under Section 4 of the pharmacy law of the State, as may place this State upon an equality with the States named, to as great an extent and at as early a date as may, by the said board, be deemed practicable."

PHILADELPHIA COLLEGE OF PHARMACY.

PRELIMINARY EDUCATION.

The greatly increased knowledge of the sciences associated with the modern practice of pharmacy, and the vast number of new remedies introduced in recent years, have necessarily been accompanied by improved methods of teaching, extension of collegiate courses, and a marked elevation of the standard of pharmacy. The Philadelphia College of Pharmacy has, from time to time, advanced the preliminary educational requirements for matriculation, and in order to pursue the course of studies proposed in the curriculum, the student must be at least 18 years of age and possess a fair preliminary education. The minimum standard for admission to the course leading up to a degree of the College, is now the equivalent of the completed first year's instruction in an approved high school or academy of equal standing.

ADMISSION BY CERTIFICATE.

To be admitted without examination, the applicant must present to the Dean one of the following evidences of possessing the required education:

(1) The diploma of a literary or scientific department of a university or college, or a high school having a course of not less than three years, or an academy having an approved high-school standing.

(2) A teacher's permanent certificate issued by a State Department of Education.

(3) The certificate of a legally authorized State Examining Board covering the required subjects.

(4) A certificate showing one year's completed work in an approved high school, or its equivalent, officially signed and sealed by the principal or other authorized officer of the school.

The applicant can obtain from the Dean of this College a blank certificate showing the required subjects of preliminary education. He must have inserted therein by the principal, or other authorized officer of the school, the particulars indicated. Careful attention to these details will prevent delay, expense, and complications.

It is very desirable that all certificates be forwarded to the Dean on or before the 15th day of September. These will be submitted to the State Examiner, who will approve them so far as the studies pursued cover the requirements for matriculation, and his report, with the credit due, will be promptly sent by the Dean to the applicant.

ADMISSION BY EXAMINATION.

An applicant who cannot present a satisfactory diploma or certificate will be required to pass an entrance examination. Credit will be given to each student for preliminary studies as indicated by the State Examiner on the application certificate, but deficiencies must be made up in the examination.

The examination will be conducted by the State Department of Education and will cover the following required subjects and such of the elective subjects as each student may select. The value or credit given to each subject will be indicated by marks, and a minimum of not less than 16 counts (four of which must be obtained for algebra and four for languages) will be required of each student.

A detailed statement of the studies and of approved text-books for the guidance of students in preparatory work is herewith presented. It is urged upon those who have not the necessary certificate of scholastic attendance, that they carefully select their electives and prepare for the examination by personal study or private tutoring prior to matriculation, and to facilitate this, the names of the text-books recommended for review are attached.

Preferred Subjects.

Language (8 counts).

ENGLISH GRAMMAR AND COMPOSITION (4 counts).

English Grammar (2 counts) will include parts of speech and their properties; declension; comparison; conjugation; general rules of syntax; analysis of sentences; meaning of words.

English Composition (2 counts).—Special attention must be paid to spelling, punctuation, capitalization, division and paragraphing.

Text-Books: Reed and Kellogg's "Higher Lessons in English;" McLean, Blaisdell and Morrow's "Steps in English" (Book II).

Latin (4 counts).

1. Grammar, including accentuation; rules for gender; declension of regular nouns, adjectives and pronouns; comparison of adjectives and adverbs; conjugation of regular verbs.

2. Vocabulary, exercises, and translations of easy sentences and selections.

Text-Books: Bennett's "Foundations of Latin;" Collar and Daniel's "First Year Latin."

Note.—In lieu of Latin, the student may elect an equivalent in one year's course in German, French or Spanish. Text-books in these: Miller's "Practical German Grammar;" Fraser and Spiers's "French Grammar;" De Torno's "Combined Spanish Method."

Mathematics (8 counts).

Arithmetic (4 counts).—The fundamental operations; fractions; decimals; interest; proportion; square and cube root; elementary mensuration—dimensions, surfaces, solids.

Text-Books: Brooks's "Normal Standard Arithmetic;" Gideon's "Model Complete Arithmetic."

Algebra (4 counts).—Including the fundamental operations, factoring, fractions, equations to quadratics.

Text-Books: Wentworth's "Short Course in Algebra;" Brooks's "Elements of Algebra."

History (6 counts).

History of the United States (4 counts).—The most important discoveries and settlements; the struggles of European nations for mastery in America; the Revolution; the leading events under the successive administrations; the War of 1812; the Mexican

War; the Civil War—the causes, most important campaigns, result; general development of our nation in extent, population, industries and power.

Constitution of the United States and Civics (2 counts).—The important features of the Constitution and Amendments; the general principles of our government; the legislative department, the executive, the judicial, with their general duties and powers; State government, the relation of State to National government, powers, officers, duties, divisions, etc.; Local government as shown by the village, town, city and county; duties of citizenship; taxes; fundamental laws.

Text-Books: McMaster's "School History of the United States" or Eggleston's "School History of the United States and its People."

Science (4 counts).

Physical and Commercial Geography.—The principal land and water divisions; the chief political divisions and their capitals and chief cities and important industries; belts or zones of climate with their characteristic plant and animal life; the most important articles of the world's commerce, and the most important commercial cities in the different countries; the most useful mineral resources; surface drainage; the general principles of physical geography.

Text-Books: Deane and Davis's "Inductive Advanced Geography;" Redway's "Natural Advanced Geography;" Houston's or Redway's "Physical Geography."

ELECTIVES.

In addition to the preceding subjects the applicant may select from the following any additional branches, each representing one year's high school course, from which he may make up the requisite number of counts, but the electives cannot displace algebra and languages, for each of which at least four counts must be obtained either by certificate or examination:—

Rhetoric (2 counts)—Text-Books: Hill's "Rhetoric;" Gardiner, Kittredge and Arnold's "Elements of Composition and Rhetoric."

English Literature and History of Literature (4 counts).—Text-Books: Tappan's "English Literature," or "Scudder's English Literature."

Greek (4 counts).—First year high-school course.

Plane Geometry (4 counts).—Three books: Wentworth's "Plane Geometry," or Brooks's "Plane Geometry."

Solid Geometry (2 counts).

Trigonometry (2) counts).

Business Arithmetic and Book Keeping (2 counts).

Physics (4 counts).—Text-Books: Gage's "Elements of Physics;" Carhart and Chute's "High School Physics" (omitting Electrostatics).

Elementary Chemistry (4 counts).—Text-Books: Shepard's "Elements of Chemistry," or Remsen's "Elementary Course in Chemistry."

Elementary Botany (2 counts).—Text-Books: Bailey's "Elementary Text Book of Botany;" Bergen's "Elements of Botany."

Physiology and Hygiene (2 counts).—Text-Books: Mills's Lessons in Physiology and Hygiene," or Dunglison's "Elementary Physiology."

English History (2 counts).—Text-Books: Montgomery's "History of England," or Tappan's "England's Story."

Greek History (2 counts).—Text-Books: Barnes's "General History," or Meyer's "General History."

Roman History (2 counts).—Text-Books: Barnes's "General History," or Meyer's "General History."

Other text-books than those mentioned may be used, provided they cover the subjects to the extent indicated.

The examination of applicants has been placed in the hands of Dr. Edgar A. Singer, Associate Superintendent of Public Schools, 696 City Hall, Philadelphia, who will pass upon the credentials and conduct the entrance examinations.

An applicant whose entrance examination or whose credentials do not fully meet the requirements (16 counts) assigned to subjects named in the preceding lists, may be admitted on an aggregate of 12 counts, *provided* he make up the remaining 4 counts before being advanced to the next higher class.

An entrance examination is held annually in Philadelphia, about the middle of September. The exact date may be obtained from the Registrar of the College, 145 N. Tenth Street.

JOSEPH P. REMINGTON, *Dean.*

BOOK REVIEWS.

A TEXT-BOOK OF PHYSIOLOGICAL CHEMISTRY for students of medicine. By John H. Long, Professor of Chemistry in Northwestern University Medical School. Illustrated. Philadelphia: P. Blakiston's Son & Co. $2.50.

For over thirty years Dr. Long has been a constant contributor to sanitary science. His papers on the chemistry of urine, feces and water have been numerous and extremely valuable. It was hardly likely that one who is so versed in, and whose contributions form such an important part of, the literature of physiological chemistry would write a book on this subject without it being of more than ordinary interest.

As a matter of fact the work has a number of meritorious features. In the first place it is written for medical students only. While it may be used profitably by other classes in which chemistry is taught it is primarily intended for students in medicine. In the second place it is written for medical students who have completed courses in the elements of general inorganic and organic chemistry. It therefore comes to us not as a book which contains much of what has been written over and over again in the hundreds of books on chemistry, but as a work with a message of its own which the author is well able to give.

Dr. Long's book is divided into five parts: (1) An introduction, including scope and methods. (2) Four chapters devoted to the consideration of the nutritives. (3) Five chapters in which the ferments and digestive processes are taken up. (4) The chemistry of the blood, tissues and secretions of the body are considered in eight chapters. (5) In three final chapters the author discusses the end products of metabolism. There is a good outline of the chemical phases of the recent theories of immunity; and a short explanation of the important application of the methods of cryoscopy, electrical conductivity and other physical processes, in the field of chemistry related to medicine. A considerable number of illustrative experiments are given in the text. There are thirty-two illustrations and an excellent index.

THE ELEMENTS OF PHYSICAL CHEMISTRY. By Prof. J. Livingston R. Morgan, Columbia University. 12mo, xii + 510 pages. Cloth,

$3.00. New York: John Wiley & Sons. London: Chapman & Hall, Limited. 1905.

That Morgan's "Physical Chemistry" is appreciated is shown by the appearance of the third edition. It is very clear in the presentation of the principles of physical chemistry, and in showing the relation of these to the other branches of chemistry. The author has succeeded in making physical chemistry "a tool by the aid of which *actual results* may be obtained." For instance, in the chapter on solutions, he (p. 123) shows how Young, by the application of the principles underlying this subject, has been able to devise a simple method for preparing absolute alcohol from a 95·57 per cent. alcohol. Instead of employing a dehydrating agent and distilling the alcohol alone, as is usually done, one can add to the alcohol containing the water, benzene *n* — hexane, and by fractional distillation the dehydrated alcohol is obtained and the benzene recovered.

In this edition the subject matter has been brought up to date and has been made as intelligible as possible, even to the non-mathematical reader. It is without doubt the best book on this subject which has thus far appeared in the English language.

Electro-Chemistry of Organic Compounds. By Walther Löb. Authorized translation from the author's enlarged and revised third edition by H. W. F. Lorenz. 8vo, x + 308 pages; 10 figures. Cloth, $3.00. New York: John Wiley & Sons. London: Chapman & Hall, Limited.

The great progress which the electro-chemistry of organic compounds has made in the past few years and the large increase in the quantity of new experimental material have required a new edition of Dr. Löb's book on this important subject. The subject matter has been entirely re-written and re-arranged. Part I is devoted to electrolytic processes: (*a*) Theoretics; (*b*) Methodics; (*c*) Electrolysis of Aliphatic Compounds; (*d*) Electrolysis of Aromatic Compounds; (*e*) Electrolysis with Alternating Currents; (*f*) Electric Endosmose. In Part II electrothermic processes and the silent electric dicsharge are considered: (*a*) Theoretics and Methodics; (*b*) The Spark Discharge and the Voltaic Arc; (*c*) The Utilization of Current Heat in Solid Conductors; (*d*) The Silent Electric Discharge and the Effect of Tesla-currents.

The book is not intended to take the place of the various excellent books on electro-chemical experiments, as those by Oettel (translated by E. F. Smith) and Elbs; but is devoted to a philosophical discussion of the general principles involved in such experiments, and is intended to give a correct interpretation of the various methods used in the electrolysis of the organic compounds. The original literature is cited and there are two comprehensive indexes, one of authors and the other of substances. The subject is extremely interesting, the book is well written, and is an important contribution to the literature of electro-chemistry.

A Systematic Course of Qualitative Chemical Analysis of Inorganic and Organic Substances, with explanatory notes by Henry W. Schimpf. 8vo, vii + 156 pages. Cloth, $1.25, net. New York: John Wiley & Sons. London: Chapman & Hall, Limited.

The book has been prepared for students in pharmacy and contains most of the inorganic as well as organic reactions that a student of pharmacy would need in his work.

Part I is devoted to Definitions and General Considerations: Notation, Classification, and Nomenclature of Elements and Organic Compounds.

In Part II is considered the Identification and Separation of Inorganic Bases and Acids: The Systematic Analysis of a Chemical Substance, Simple or Compound; Heat Test, Sulfuric-acid Test, the Charcoal Test, Sodium-carbonate Test, the Hydrochloric-acid Test, Table for the Identification of the Metals, Chart for the Separation of the Metals (Group I to V), Chart for the Separation of Insoluble Phosphates, Preparation of a Solution for Analysis in the Wet Way, Alloys and Hard Metals, Table Showing the Solubility of the More Commonly Occurring Salts, the Identification of Acids and Acidulous Radicals, Systematic Detection of the Acids in Solutions, Special Tests for Acids of Groups I to IV, Special Tests for Organic Acids.

Part III is devoted to Qualitative Analysis of Organic Substances: Behavior of Organic Substances with Immiscible Solvents; Behavior of Organic Substances with Fehling's Solution; A Systematic Scheme for the Identification of the Most Important Carbohydrates; Chart for the Detection of the More Common Organic Compounds of Pharmaceutical Interest. Class A. Division *a*. Liquids Miscible with Water; Methods for the Detection of Methyl Alcohol in Grain

Alcohol, Pharmaceutical Preparations, Beverages, etc. Class A. Division *b*. Liquids not Miscible with Water. Class B. Scheme for the Identification of Acetanilide, Phenacetin, Quinine Sulfate; Prof. E. H. Bartley's Scheme for the Identification of Organic Substances Commonly Used in Pharmacy, Medicine, and the Arts; Inspection; Separation of Organic Compounds into Groups; Ultimate Qualitative Analysis of Organic Compounds; Summary of Non-nitrogenous Classes of Organic Bodies; Identification of Scaled Iron Compounds; A Scheme for the Detection of Poisons; A Scheme of Urinalysis; Preparation of Reagents.

Taken in conjunction with a course of lectures on analytical chemistry this work is quite replete and covers the ground for which it is intended very well.

WHYS IN PHARMACY.—A compilation of reasons underlying the principles of pharmacy, supplemented by a table of equations. By Edsel A. Ruddiman. 12mo, vi+196 pages. Cloth, $1.00. New York: John Wiley & Sons; London: Chapman & Hall, Ltd.

In the preface of Dr. Ruddiman's book the reasons for its publication are given as follows:

"In the publication of these questions and answers the writer claims no originality. The only reason he has for putting them into book form is because he has had numerous requests for them from his students and the readers of the *Bulletin of Pharmacy* in which much of the matter has been printed.

"Early in the course of the author's teaching he came to the conclusion that the teaching of the reasons for the use of certain ingredients and for mixing these in certain orders is one of the most important parts of the work—more essential than the memorizing of formulas. The book is not intended as a quiz compend, but as an aid to those who wish to get at the principles underlying the subject. At first only the questions were written, leaving the student to look up the answers for himself. Mr. Joseph Helfman, editor of the *Bulletin of Pharmacy*, suggested that more good would be done the readers by giving the answers as well, and the writer came to the same conclusion."

The following subjects are considered: (1) Preparations: Waters, cerates, papers, collodions, decoctions, elixirs, plasters, emulsions, percolation and fluid extracts, solid extracts, glycerites, infusions,

liniments, solutions, masses, mixtures, mucilages, oleates, oleoresins, oils, pills, powders, resins, spirits, suppositories, syrups, tinctures, troches, ointments and wines. (2) Chemicals: Acids, inorganic compounds, aluminum salts, ammonium salts, antimony salts, silver salts, gold salts, bismuth salts, calcium salts, chromium salts, iron salts, mercury salts, magnesium salts, lead salts, potassium salts, sodium salts, sulphur and zinc salts. (3) Organic drugs; (4) Alkaloids; Drug assays; (5) Prescriptions; (6) Miscellaneous; (7) Equations.

The book contains a large amount of information valuable to the student. The only question which arises in looking over books of this kind is whether the student might not "dig it out" for himself and whether he does not actually get this information in the quizzes supplementing the courses of lectures in colleges of pharmacy.

Select Methods in Food Analysis. By Henry Leffmann and William Beam. Second edition, revised and enlarged. With one plate and fifty-four other illustrations. $2.50 net. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut Street.

A work on food analysis to maintain its authority must be frequently edited. The second edition of this valuable work of Drs. Leffmann and Beam will be welcome to all food analysts. The present edition contains numerous alterations and much new matter has been inserted. Among the additions are: Detailed descriptions of special arrangements for polarimetry, distillation and extraction; new processes for detection of natural colors used as substitutes for fruit and egg colors; improvements in detection of formaldehyde, abrastol and saccharin; rapid methods for examination of vanilla and lemon extracts, and for the determination of fat in condensed milk and cereal foods; determination of boric acid in fruit juices; analytic data in regard to fruit juices, jams and jellies; detection of palm oil in oleomargarin, and many minor modifications of tests and processes intended to simplify or expedite analysis.

As rewritten this work of Leffmann and Beam is thoroughly up-to-date, full of analytical data and methods, and is one of the most useful books on food analysis that has been prepared.

Caspari's Pharmacy. A Text-Book on Pharmacy. For Students and Pharmacists. By Charles Csapari, Jr., Maryland College of Pharmacy, Baltimore. New (third) edition. Octavo, 830 pages,

with 301 illustrations. Cloth, $4.25, net. Philadelphia and New York: Lea Brothers & Co. 1906.

Caspari's Pharmacy has been written with the view of affording to students and pharmacists a kind of commentary on the Pharmacopœia. The subjects considered are grouped under three distinct headings. Part I comprises general pharmacy, which includes the study of weights and measures, specific gravity, the application and control of heat, mechanical subdivision of drugs and methods of solution and separation, together with a classification and description of the various plant products and solvents used in pharmacy. Part II treats of practical pharmacy, or the study of official galenical preparations and the consideration of operations of the dispensing counter. This is one of the most original and valuable portions of the book. Part III is devoted to the study of pharmaceutical chemistry or the chemistry of the inorganic and organic substances of the Pharmacopœia. There is also a chapter on the animal products used in pharmacy.

This work by Caspari contains a large amount of information which is of great value to both students and pharmacists. The chemistry of the book is particularly strong. Some statements in the book might be questioned in the light of recent researches, as under the assay of ipecac, where it is stated "It is possible to separate the cephaeline from the emetine . . . but for purposes of valuation of the drug this more tedious method is quite unnecessary." The researches of Paul and Cownley (see this JOURNAL, Vol. 73, p. 116) would seem to show that this is as necessary as the separation of strychnine in the assay of nux vomica as now directed by the Pharmacopœia. There are a number of typographical errors, as the misspelling of the Latin botanical name of the plants yielding strophanthin (p. 789). The words "natural order" occur where the term "family" should be used in a number of cases (pp. 734, 737, etc.).

MATERIA MEDICA, PHARMACY AND THERAPEUTICS. Revised in accordance with the new U.S.P., including the physiological action of drugs, special therapeutics of disease, official and practical pharmacy, minute directions for prescription writing, incompatibility, etc. By Samuel O. L. Potter. Tenth edition. Octavo. Cloth, $5.00; leather or half morocco, $6.00 net. Philadelphia: P. Blakiston's Son & Co., 1012 Walnut Street.

Potter's Materia Medica is one of the most widely used books on this subject in the United States. In the present edition one hundred and thirteen new articles and paragraphs appear, and four hundred articles have been rewritten. There is a thumb index indicating each main division of the book, which will greatly facilitate its use.

A TEXT-BOOK ON MODERN MATERIA MEDICA AND THERAPEUTICS. By A. A. Stevens, of the University of Pennsylvania and the Woman's Medical College of Philadelphia. Fouth edition, revised. Octavo of 670 pages. Cloth, $3.50 net. Philadelphia and London: W. B. Saunders & Co. 1905.

This new edition of Stevens's work on materia medica and therapeutics has been revised and adapted to the Eighth Decennial Revision of the United States Pharmacopœia. New articles dealing with scopolamin, ethyl chloride, theocin, veronal and radium have been introduced, and in the section on radiotherapy much new matter has been incorporated.

A SHORT MANUAL OF ANALYTICAL CHEMISTRY, qualitative and quantitative—inorganic and organic. By John Muter. Fourth American edition. Illustrated. The chapters relating to the analysis of drugs being based upon the Eighth Revision (1905) of the United States Pharmacopœia. Philadelphia: P. Blakiston's Son & Co.

Muter's manual has long been recognized as a concise and valuable work on the qualitative and quantitative analysis of inorganic and organic substances. The present edition has been made to conform to American requirements and has been edited for the use of analysts in this country. Part I, on qualitative analysis, is devoted to the consideration of: (*a*) the processes employed by practical chemists; (*b*) detection of the metals; (*c*) detection and separation of acid radicals; (*d*) qualitative analysis, as applied to the detection of unknown salts; (*e*) qualitative detection of alkaloids and certain organic bodies used in medicine, with a general sketch of toxicological procedure. In Part II, on quantitative analysis, are considered: (*a*) weighing, measuring and specific gravity; (*b*) volumetric quantitative analysis; (*c*) gravimetric quantitative analysis of metals and acids; (*d*) ultimate organic analysis; (*e*) special processes for the analysis of water, air and food; (*f*) analysis of gases, polarization and spectrum analysis, etc.

A TEXT-BOOK OF CHEMISTRY for the use of students and practitioners of medicine, dentistry and pharmacy. By William R. Jones, University College of Medicine, Richmond, Va. Illustrated. Philadelphia: P. Blakiston's Son & Co.

This work is a general chemistry adapted to the use of students in medicine, dentistry and pharmacy. The following subjects are considered: Physics, chemical philosophy, inorganic chemistry, organic chemistry, methods of quantitative analysis, physiological chemistry. The book is well written and will be found useful in the courses for which it is proposed.

TEXT-BOOK OF MEDICAL AND PHARMACEUTICAL CHEMISTRY. By Elias H. Bartley, Long Island College Hospital. Sixth edition, thoroughly revised, with ninety illustrations. Philadelphia: P. Blakiston's Son & Co.

Bartley's chemistry is intended for students in medicine and pharmacy and is becoming more valuable with each new edition. It contains a large amount of information regarding the composition of many common substances. The subject matter is presented in quite an instructive and more or less original manner.

NEUE ARZNEIMITTEL ORGANISCHER NATUR. Vom pharmazeutisch-chemischen Standpunkte aus bearbeitet. Von L. Rosenthaler. Berlin: Verlag von Julius Springer. 1906. M. 6.

This work is written particularly for the use of pharmacists. The more important new remedies are considered, and they are divided into the following classes: (*a*) anesthetics and hypnotics; (*b*) antiseptics; (*c*) antipyretics; (*d*) purgatives; (*e*) diuretics, etc. Under each synthetic is given the composition, preparation or mode of manufacture; properties, tests, uses and other special features.

It is a first-rate little book and to be recommended to pharmacists, chemists and others interested in the subjects which are considered.

PHILADELPHIA BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

In pursuance of the following letter a preliminary meeting for inaugurating a local branch of the American Pharmaceutical Association was held in the Museum of the Philadelphia College of Pharmacy on Tuesday, March 20, 1906, at 2.30 P.M.:

PHILADELPHIA, PA., March 15, 1906.

To the Local Members of the American Pharmaceutical Association :

To more readily attain the objects sought by the founders of the American Pharmaceutical Association, and in accordance with a resolution adopted at the Fifty-first Annual Meeting, held at Mackinac Island, Michigan, in 1903, it has been suggested that a branch of this Association be inaugurated and maintained in the city of Philadelphia.

You are cordially invited to attend a preliminary meeting to be held in the Philadelphia College of Pharmacy on the afternoon of Tuesday, March 20, 1906, at 2.30 o'clock, and to sign the necessary petition to the Council of the American Pharmaceutical Association, and a call for a general invitation to all of the local members of the Association to be present at a subsequent meeting for formal organization.

JOSEPH P. REMINGTON,
WILLIAM MCINTYRE,
MARTIN I. WILBERT.

On motion of Professor Remington, Mr. J. H. Redsecker, of Lebanon, Pa., was requested to take the chair, and Mr. M. I. Wilbert, of Philadelphia, was requested to act as Secretary.

Professor Remington then briefly outlined the object of the meeting, and requested the Secretary to read the following proposed general invitation to a formal meeting, to be held on Wednesday, March 28, 1906, at the College of Physicians:

The undersigned members of the American Pharmaceutical Association, having petitioned the Council of that Association for the privilege of forming, in the city of Philadelphia, a local branch to be known as the Philadelphia Branch of the American Pharmaceutical Association, hereby extend to you an invitation to be present at a meeting for formal organization, to be held on the evening of Wednesday, March 28, 1906, in the lower lecture hall of the College of Physicians, N. E. cor. Thirteenth and Locust Streets, at 8 P.M.

Among the more direct objects to be sought for and attained by the institution of such a local branch, we may suggest:

The development of a scientific spirit among the members of the local profession.

A more complete adherence to the Pharmacopœia of the United States, and other generally accepted and well-known formularies, in making the preparations to be used in the practice of medicine.

The discovery and exposure of frauds and of fraudulent or dishonest practices in connection with the materials used as medicine.

The elimination of secrecy and fraud from the practice of pharmacy and the cultivation of a proper appreciation, by members of the medical profession and others, of the ability, duty and position of an up-to-date pharmacist.

All members of the American Pharmaceutical Association, and all reputable pharmacists who are in accord with the principles of that association, are invited to attend this initial meeting and to become active members of the local branch.

This general invitation was, on motion, adopted.

Professor Remington then read the proposed petition to the Council of the American Pharmaceutical Association.

On motion of Mr. Cliffe, Prof. Joseph P. Remington, Mr. William McIntyre and Mr. M. I. Wilbert were appointed a committee to draw up, and to present at the next meeting, a set of rules or bylaws for the guidance of the local branch.

There being no further business the meeting was declared adjourned until Wednesday, March 28th, and the members present invited to sign the following petition to the Council:

To the Council of The American Pharmaceutical Association:

We the undersigned members of the American Pharmaceutical Association, respectfully ask that you extend to us the privilege of forming a local branch of the American Pharmaceutical Association, in the City of Philadelphia, to be known as the Philadelphia Branch of the American Pharmaceutical Association.

Our aim in inaugurating this local branch is to extend and to popularize the objects and the established precedents of the American Pharmaceutical Association, and to secure for pharmacy, and for her votaries and followers, the recognition that is rightfully due them for their contributions to the progress and welfare of the human race.

SIGNED.

J. H. Redsecker.	Joseph P. Remington.	F. P. Stroup.
A. M. Hance.	George W. Davis.	E. H. Hance.
Wm. R. Warner, Jr.	Richard M. Shoemaker.	William McIntyre.
Charles A. Weidemann.	George B. Weidemann.	J. T. Harbold.
W. L. Cliffe.	Clement B. Lowe.	Aquila Hoch.
Edwin M. Boring.	J. C. Peacock.	Franklin M. Apple.
Joseph L. Lemberger.	Charles T. George.	Joseph W. England.
George M. Beringer.	Chas. H. LaWall.	Chas. E. Vanderkleed.
Samuel P. Sadtler.	M. I. Wilbert.	Henry Kraemer.

PHARMACEUTICAL MEETING.

The stated Pharmaceutical Meeting of the Philadelphia College of Pharmacy was held on Tuesday afternoon, March 20th, with J. H. Redsecker, Ph.M., of Lebanon, Pa., in the chair.

The meeting was devoted to a symposium on the subject of the use of antiseptics in foods. The interest attaching to this subject at present and the prominence of the speakers on the programme combined to attract a number of representative pharmacists and others as well. Following are the names of some of those in attendance: Thomas S. Wiegand, James T. Shinn, Joseph L. Lemberger, Charles T. George, Louis Emanuel, E. M. Boring, Geo. M. Beringer, W. L. Cliffe, E. Fullerton Cook, Joseph W. England, E. H. Hance, A. M. Hance, Ambrose Hansberger, C. M. Kline, Clement B. Lowe, Charles H. LaWall, Wm. McIntyre, Henry Kraemer, Franklin M. Apple, Aquila Hoch, J. T. Harbold, Geo. W. Davis, Mr. and Mrs. J. C. Peacock, Warren H. Poley, Joseph P. Remington, Richard M. Shoemaker, Samuel P. Sadtler, F. P. Stroup, Chas. A. Weidemann, Wm. R. Warner, Jr., M. I. Wilbert, Chas. E. Vanderkleed, C. P. Gabell, Prof. Susannah G. Haydock and Dr. Mary Pennington.

Dr. H. W. Wiley, Chief of the Bureau of Chemistry, U. S. Department of Agriculture, was the first speaker introduced, and gave an address on "The Use of Preservatives in Foods." (See page 153.)

Dr. H. C. Wood, Jr., of Philadelphia, followed with a paper entitled, "Is the Use of Food Preservatives Justifiable?" This paper will probably be published in full in a subsequent issue of this JOURNAL. Dr. Wood said that knowing the conditions which have to do with the commerce in foods, he desired to be fair to manufacturers, but that he was pretty thoroughly convinced that the use of chemical preservatives is not justifiable. He was opposed to their use even when the name and quantity of the chemical used are given on the label or otherwise stated, for the reason that the majority of consumers are not able to judge as to the harmlessness or harmfulness of preservatives. He said that the subject is one of special interest to physicians and pharmacists, and he urged those in attendance to use their influence in securing the passage of the Pure Food Bill now before the House of Representatives.

Joseph L. Lemberger, president-elect of the American Pharmaceutical Association, said that for some time he had had a conviction

that the use of food preservatives was not desirable, and that his position had been criticised both favorably and unfavorably, the advocates of preservatives claiming that their use is to be recommended under certain circumstances, as, for instance, in delay in transportation. Mr. Lemberger said that in view of the arguments advanced by Dr. Wiley and Dr. Wood, he felt that it would be wrong to encourage the use of preservatives. He said that he personally was opposed to the use of foods containing them and that what he did not favor for himself he did not consider good for his neighbor. Referring to the Pure Food Bill, he hoped that it would pass both houses of Congress, and said that then provision should be made for the proper inspection of food products, so as to insure their purity.

Warren H. Poley desired to know if preservatives have the same effect after being applied to food as when administered directly, or, in other words, if the preservative combines with the food material in such a manner as to be less harmful than it otherwise would be. Dr. Wiley in reply said that in the experiments which he had been making the chemicals had been directly administered, that his object had been to study the effects on the organism and not on the foods. He said that borax undergoes no change when applied to foods, and stated that in those cases where there is a combination of the chemical and food product the effect of the chemical on the organism would ultimately be realized.

Prof. Joseph P. Remington said that he was in favor of improving the quality of foods, but that he was not quite convinced that a small amount of preservative is objectionable. In this connection he referred to an experience of Dr. Squibb during the Civil War. Dr. Squibb had undertaken to supply the army with chloroform and ether, but in transporting these liquids over the mountains in Virginia and the neighboring States, they were decomposed, the chlorine being liberated from the chloroform, and it was found necessary to add a small quantity of alcohol to prevent decomposition. On the other hand, Professor Remington said that he was thoroughly assured that if food preservatives are used, the fact should be stated on the label, and that this also applies to all medicines and proprietary preparations.

FLORENCE YAPLE,
Secretary pro tem.

THE AMERICAN
JOURNAL OF PHARMACY

MAY, 1906.

NOTES ON THE NEW PHARMACOPŒIA.[1]

By W. M. Searby.

Before proceeding to discuss the Pharmacopœia, which is to be my principal theme this morning, I want to say a few words to the members of the Junior Class. Some of you have perhaps come here under the impression that the work is very easy, and that the Faculty and Instructors will do most of it for you. Others are impressed with the opposite view, that the work is attended with much difficulty, and that only very bright students have a good chance to graduate. Let me say to you that both of these views are erroneous. The work in college is not so easy that any of you can do it without effort, and graduate with credit. The Faculty will give you every assistance in their power to acquire the knowledge which you have come here to obtain. They will render the pursuit thereof as easy as it is wise to make it, perhaps as easy as possible, but there is a great deal that they cannot do. They do not demand much of you in the way of memorizing, but nevertheless there are some things which must be committed to memory, and this the Faculty cannot do for you. There is also a certain amount of reading and thinking which has to be done if you would have a comprehensive knowledge of the various subjects which will be presented to you. The Faculty cannot do your reading, they cannot do your thinking, and it is not all so very easy that anybody can do it with half trying. The work must be done systematically, promptly, day by day, if you would have a clear understanding of all matters submitted to you, grasp them thoroughly, and make

[1] An address delivered before the student body of the California College of Pharmacy, September 7, 1906.

them a part of yourself; and nothing short of this will satisfy the Faculty. Nothing short of this should satisfy you.

To those who are laboring under the opposite impression, namely, that the work will be so hard that only bright students can master it, let me say that this view is also wide of the mark. For thirty years I have been teaching in this College, and I have seen students who are anything but bright make a most creditable record in their various branches of study. I have seen the fable of the hare and the turtle verified many times, the quick fellow coming in behind the slow one. Patient, persistent application has often achieved more under my observation than brilliant abilities; but this has called for self-denial and effort; and when these have been duly exercised, the result has been success.

Two men have been before the world the last few months, perhaps more than all others, President Roosevelt and Admiral Togo. Neither of them would have been where he is now, neither of them would have rendered to his country the invaluable services which he has given but for the fact that both of them exercised, in their early career, a remarkable degree of self-denial. When President Roosevelt was a youth, he was handicapped by poor health. He had wealth, and might have indulged himself, as most wealthy invalids do, but he preferred to make a vigorous effort to overcome his disability. He took up the life of a cowboy, exposed to heat and cold, fatigue and hunger, and everything from which the ordinary invalid would shrink. The luxuries of the table, of the cosy home, of the downy pillow, and all the coddling which he might have had, if he had given way to his infirmity, he threw aside. By roughing it, as we call it, for several years, he became strong and vigorous. He found more real pleasure in the strenuous life than in one of ease and indulgence. The result was that, when he went back to the activities and strain of city life, he was hardy enough to undertake them. His whole life from that date to the present has shown us that it is possible to make a vigorous, hearty, cheerful, buoyant, strenuous, energetic man out of an invalid. When he departed for Wyoming, he went to prepare himself for his life's work, and no adequate preparation can be made by any young man for a career of great activity without self-denial and effort; but these will overcome almost all obstacles.

It is possible that President Roosevelt had extraordinary natural

abilities. I have never heard that this was the case. I am of the opinion that he owes his success more to his own efforts than to natural talent greatly above the average. But I want to speak to you now of a man who was never considered to have more than ordinary ability, and yet see what he has accomplished. I refer to Admiral Togo. At fifty-eight years of age he stands before the world as its greatest admiral. Let us look at his career. His parents seem to have been moderately well to do. His mother, a person of more than ordinary ability, up to his twelfth year gave him all the schooling that he had. From twelve to fifteen years of age, he studied under a teacher all the branches of knowledge and all the accomplishments which were taught in Japan at that time. "Friends of the family, who remember him as a boy, say that he was a diligent student, and that among the boisterous and turbulent boys of Satsuma, where he was living, he was distinguished for his modesty and quiet seriousness of demeanor; but no one who knew him, gave him credit for anything more than ordinary ability." When fifteen years old, he became a naval apprentice on a Japanese warship. When scarcely seventeen years old he was on board a man-of-war when some firing took place between some British and Japanese ships, and Togo appears to have been impressed with the gun-practice and tactics of the British ships, for he seems then to have formed the purpose to go to England for the purpose of studying naval science, and it is believed that that decision came as the result of the experience he had at this time. Accordingly, when twenty-two years of age, he went to Yokohama, and there began the study of the English language, meanwhile begging the Japanese government to send him as a naval student to Great Britain. Two years later he was sent, being one of a party of twelve. Of his life in England we have very little information, but he finally succeeded in obtaining a cadetship on the warship Worcester at Plymouth. Capt. Henderson Smith, who was then in charge of the Worcester, said this of Togo: "Togo was an excellent fellow. He was not what you would call brilliant, but a great plodder, slow to learn, but very sure when he had learned it, and he wanted to learn everything. He was a quiet, good, temperate young fellow, and as brave as a lion." It is a noteworthy fact that none of the people who knew Togo in the early part of his life, gave him credit for talent or exceptional ability of any kind. His English teacher in Yoko-

hama said of him. "He was a quiet, honest student, but *would never make any mark!*"

This is the man who has astonished the world with his achievements in naval warfare. To what does he owe his marvellous success? *To his perseverance and his ample preparation.* Togo noticed that men-of-war, when practicing, did their work in smooth water, at an average range of 2000 yards, firing at stationary targets. Somebody conceived, and most likely it was Togo, the idea of practicing in rough water, to hit targets also in rough water. This gives the actual condition of naval warfare. The Japanese began practicing at long range distances of four or five miles, and they attained astounding skill in hitting comparatively small objects at great distances. Their ability in this way gave them a victory over the Russians who had twice the number of ships. In summing up a review of Togo's life, George Kennan lays great stress upon one thing as contributing to his extraordinary success, and that is "thoroughness in preparation," and it is this which I commend to you. It should not be difficult for you, gentlemen of the Junior Class, to see from the careers of President Roosevelt and Admiral Togo that self-denying and persevering application is all that you need to attain success as students in pharmacy.

Some of you have already learned something of natural science—of botany, of physics, of chemistry, or some other branch. You surely must have found that each new branch of science brought you some new pleasures. Vast are the possibilities in this line. How many hidden beauties there are in the natural world that are yet to be revealed to you. Dr. Lyman Abbott, one of our deepest thinkers, says "every new epoch in a man's education develops into activity a before dormant faculty, and opens for him a before closed world. The little child learns to *read*, and with this acquisition he is born into the world of literature of which before he could know nothing. He studies *art* under a wise teacher. He learns to see, to understand, and to appreciate beauty, and he is born into the world of art. He never was before. He studies *music*. Before, he had, as the saying is, no ear for music. His musical ear is born. He enters into still another world. Each new step in his development is a new birth. By the influence of music, art, and literature, he is lifted up into the world which they occupy."

We shall hope to help you to see a little more clearly into the

depths of these mysteries of science. We shall hope thereby to kindle in your breasts an enthusiasm in the pursuit of this kind of knowledge. Incidental to this, we shall hope to add to your happiness, to make life more to you, to make it richer, clearer, more beautiful, as you see and enjoy the beauties around you—the beauty of natural objects, the beauties of form, of color, of movement, beauties of natural law, of proportion, of relation of cause to effect. We shall hope to help you to use some of the knowledge thus acquired in the pursuit of your art. But do not make the mistake of seeking to practice your art until you have fully mastered the science upon which that art is based. Only by this course can you expect to be successful pharmacists.

* * * * * * *

It has been the custom for a long time to speak of each different edition of the United States Pharmacopœia as that of the year of its revision. Thus we have the Pharmacopœia of 1820, 1850, 1880, and 1890, but inasmuch as it usually took from two to three and a half years to prepare each revision, it always happened that the work was issued several years later than the date which it bore. It has been thought best, therefore, to drop that method of designating the work, and to call it as in the present instance "The Eighth Decennial Revision." From the year 1820, when the first United States Pharmacopœia was issued, it has been revised every ten years, but the work of revision has in recent times been so laborious that it has taken a long time to get it ready for issuance. It may seem strange to some of you that it should have taken five years in the present case to revise this book, but a close examination will show that the amount of work to be done was very great. And when you remember that this work was done by twenty-five persons residing in some cases at great distances from their co-laborers, and that they had to be consulted about a thousand and one small details, you can see that this alone would occupy a great deal of time. But this is not all. Some changes have been made which have involved a great deal of technical work. For instance, specific gravities in the Pharmacopœia of 1890 were to be taken at 15° C.=59° F., they are now to be taken at 25° C.=77° F. The reason for this change is that 77° F. is nearer the average temperature of stores and laboratories in which the specific gravities have to be taken. Solubilities in like manner are to be taken at 77° F.,

and the determining of these solubilities has involved another large amount of work. In addition to this was the work of revising and improving formulas, processes, and chemical tests, every line of which had to be carefully considered. There should therefore be no criticism on account of its having taken five years to get out this work.

Another thing to be remembered in connection with this Pharmacopœia is that the date when it becomes official is marked on the title page, namely September 1, 1905. We are, therefore, supposed to be now dispensing all preparations of the strength of the new Pharmacopœia.

The *scope* of the Pharmacopœia has been modified by the following section in the general principles of revision :—

"The Committee of Revision is authorized to admit into the Pharmacopœia any product of nature of known origin; also any synthetized product of definite composition which is in common use by the medical profession, the identity, purity, or strength of which can be determined. No compound or mixture shall be introduced if the composition or mode of manufacture thereof be kept secret, or if it be controlled by unlimited proprietary or patent rights."

This section excludes phenacetin under its copyrighted name, but admits it under its chemical name of acetphenetidin. It excludes urotropin, which, however, can be sold and dispensed under its chemical name, hexa-methylen-amin; sulphonal can be sold and dispensed as sulphon-methane; and trional can be dispensed as sulphon-ethyl-methane; aristol under its chemical name, thymol-iodide; urethane under the name of ethyl carbamate; saccharine under its chemical name, benzo-sulphinide. Antipyrin is admitted under its patented name, because the patent has expired, and it is no longer necessary for any one wishing to prescribe antipyrin to write phenyl-di-methyl-pyrazolon.

These names seem to be unmercifully long. Yet an effort has been made to shorten them by dropping the Greek prefixes. Thus di-thymol di-iodide becomes thymol iodide. Diethyl-sulphon-methyl-ethyl-methane is shortened to sulphon-ethyl-methane. (Trional.)

It is doubtful whether any considerable use will be made of these sesquipedalian names. Either shorter names must be invented or we shall have to wait until the patents on these names have expired.

In the case of those which have been simply trade-marked, it is almost impossible to tell whether these will ever expire. There seems to be no limit to the duration of the trade-mark.

Another new feature in the Pharmacopœia is the introduction of *doses.* These are intended to be the average approximate doses for adults. The quantities are expressed in both metric and ordinary American weights and measures, the gramme being approximately the equivalent of 15 grains; 65 milligrammes of one grain; 250 milligrammes, four grains; one milligramme $\frac{1}{64}$ of a grain, etc., etc. I have not had time to examine many of these doses, yet I noticed an apparent inconsistency in the dose given for syrup of squill and compound syrup of squill, the former being the equivalent of 1·35 grains of squill, the latter 2·4 grains of squill, which carries with it 2·4 grains of senega, and $\frac{1}{6}$ grain antimony and potassium tartrate. The dose of the syrup of squill is too small, and that of the compound syrup considerably too large. The quantity there given would nauseate anybody who should take two or three doses. The first dose would have that effect upon most persons, yet it is not enough as an emetic.

Another noteworthy feature of the Pharmacopœia is the insertion of what is called the "*purity rubric*," by which is meant a definition of the degree of purity required for medicinal purposes. The reason for the introduction of this rubric is that in some States rigid laws have been enacted rendering pharmacists liable to severe penalties for selling drugs or pharmaceutical preparations below the standard of purity and strength of the U. S. Pharmacopœia. If absolute purity should be demanded, the cost of many drugs and preparations would be so greatly enhanced as to almost throw them out of the market. In the case of many chemicals, a small amount of impurity of an innoxious character is unobjectionable, and yet to remove that small amount would add greatly to the cost of the product. Thus, sodium bicarbonate may contain 1 per cent. of impurity. As that impurity consists almost entirely of sodium chloride and sodium sulphate, it is, of course, perfectly harmless. Sodium bromide and sodium citrate are required to have 97 per cent. of the pure salt; sodium hypophosphite, 98 per cent., sodium borate, potassium permanganate, potassium nitrate, and potassium iodide are required to have 99 per cent., while lead oxide is required to have only 96 per cent. In order that no unfair use should be

made of the Pharmacopœia in cases where pharmacists have sold drugs and chemicals for other than medicinal purposes, the following paragraph has been inserted in the preface :—

" Inasmuch as there has existed in the past on the part of the public a misconception of the purposes of a pharmacopœia, and penalties have been imposed upon those who have sold substances bearing pharmacopœial names which were to be used in the arts, for manufacturing, and other purposes, and not as medicines, it has become necessary to make the following declaration :—

The standards of purity and strength prescribed in the text of this Pharmacopœia are intended to apply to substances which are used solely for *medicinal purposes and when professedly bought, sold, or dispensed as such*."

One of the most important features of the new Pharmacopœia is the insertion of *assay processes* for a number of drugs and their preparations in addition to those which were in the old Pharmacopœia.

The instructions from the Pharmacopœial Convention were " to append assay processes to as many of the potent drugs and preparations made therefrom as may be found possible, provided that the processes of assay are reasonably simple, both as to methods and apparatus required, and lead to fairly uniform results in different hands."

The processes given, so far as I have been able to examine them, are as simple as they could be to secure the results desired. Yet I doubt not, many persons will question whether they are " reasonably simple." It is to be borne in mind that this assay work requires some skill and care, and only persons reasonably skilled will be able to make reliable assays by any processes that may be given them. Processes have been introduced for the assay of the following drugs and their preparations :—

Aconite, belladonna leaves, belladonna root, cinchona, red cinchona, coca, colchicum corm, colchicum seed, conium, guarana, hydrastis, hyoscyamus, ipecac, jalap, nux vomica, opium, physostigma, pilocarpus, scopola, and stramonium. Some will think that the list should have been more lengthy, but it is a great gain to have even these.

Still another new feature in the Pharmacopœia is the introduction of diphtheria *antitoxin*, which is now official under the name of serum anti-diphthericum ; also of dried *thyroid glands*, and *suprarenal capsules*.

While the Pharmacopœia contains 90 pages more than that of 1890, the number of articles which are now official is less by 34, 151 having been dismissed, and 117 new ones introduced.

Among those dismissed are some which the older pharmacists will regret, if only for association's sake, such as kermes mineral, Plummer's pill, turpeth mineral, emplastrum-de-vigo cum mercurio, massa copaibae, potassa cum calce, pulvis antimonialis, and last, but not least, to some of you, tobacco.

Among the new articles inserted in addition to the synthetics already refered to, we find acetone, trichloracetic acid, ethyl chloride, hamamelis water, cresol, liquor cresolis compositus (resembling lysol), solid and fluid extract of scopola, three acetatracts (that is acetic fluid extract of lobelia, sanguinaria, and squill); guaiacol carbonate, iodol, kaolin, antiseptic solution (resembling listerine), liquor sodii phosphatis compositus (resembling melachol), methylene blue, liquefied phenol, compound acetanilid powder (a migraine or headache powder), saw palmetto (under the name of sabal), scopolamine hydrobromide, strophanthin, and vanillin.

A few of the more noticeable *changes in name* are the following:—

Arsenous acid is now more correctly called arsenic trioxide; chromic acid, chromium trioxide; carbolic acid is now known as phenol. Haloid salts of the alkaloids are now called hydrochlorides instead of hydrochlorates; hydrobromides instead of hydrobromates, etc. Ferri oxidum hydratum is now ferri hydroxidum, and the same nomenclature applies to the other hydroxides (sodium, potassium, etc.), resin plaster is now adhesive plaster, liquor potassæ and sodæ are now liquor potassii and sodii hydroxidi. Resorcin is now resorcinol. Salol is given its full chemical name, phenylsalicylate. Sodium hyposulphite is now thiosulphate. Sodium sulphocarbolate is now denominated as sodium phenolsulphonate. Chlorine water is no longer recognized as aqua chlori but as liquor chlori compositus. The preparation differs, however, from the chlorine water of 1890, being made from potassium chlorate, hydrochloric acid and water by the usual method of preparing chlorine water extemporaneously. It contains various compounds of potassium and chlorine as well as the free gas. Catechu is no longer found in the Pharmacopœia, its place being taken by gambir (terra japonica). I am at a loss to understand the reasons for this change,

as I have always preferred the catechu of acacia to gambir. I understand the reason to be that black catechu (cutch) was not always obtainable of good quality. I have never found any difficulty in this respect.

A change in name which will surely create considerable comment is the substitution of the word fluidextractum for extractum fluidum. The object of coining this peculiar word seems to have been to get all the fluid extracts together. This could easily have been accomplished, and in fact was accomplished in some of the earlier pharmacopœias, by adopting a heading for each series of preparations. This brought all of the fluid extracts, liniments, etc., together under their respective headings. To my mind this method is far preferable to the coining of such a word as fluidextractum.

Among the changes in regard to *strength and purity*, one of the most noticeable is that of alcohol, which formerly was required to have 94 per cent. of absolute alcohol. It is now practically 95 per cent., the exact requirement being 94·9 per cent. In like manner diluted alcohol, which was formerly required to contain 48 6 per cent. by volume, is now required to have 48 9 per cent.

A change that will be of more interest to some persons is in regard to whiskey, which in 1890 was entitled to recognition when it was two years old, but now must attain to the greater age of four years. Formerly it was required to have from 50 to 58 per cent. of absolute alcohol, while now it will pass muster at from 44 to 55 per cent. The preparation of 1890 was spelled whiskey; that of 1900 whisky. Hence, if you wish to sell an article that is less than four years old, and steer clear of any legal entanglement, you will label it whiskey; but if you wish to intimate that the article sold has the mellowness of mature age, you will spell the whiskey without the "e." There may be some persons who prefer the fiery ardor of youth to the mellowness and blandness of maturity, but connoisseurs will call for the official drink, because of its oil-like smoothness and clinging richness of flavor.

A similar change will be noticed in regard to white and red wine, which in 1890 were required to contain alcohol to the extent of from 12·4 to 17·3 per cent. They will now pass muster if they contain from 8·5 to 15 per cent. by volume.

The greatest number of *changes in strength* is to be found in the tinctures, 32 of which are different in this respect from those we

have been accustomed to make. An effort has been made to make the U. S. Pharmacopœia conform in regard to the strength of tinctures, acids, and some other preparations with those of European countries. This desire has led to the reducing of quite a number of tinctures from 35, 20, and 15 per cent. to 10 per cent. I will not enumerate them now, because you cannot remember them as I read them to you, but I will mention a few that should be memorized in view of the potency of the drugs:—

Tincture of aconite formerly 35 per cent. is now 10 per cent.

Tincture of veratrum formerly 40 per cent is now 10 per cent.

Tincture of nux vomica formerly 12½ per cent. is now 8 per cent.

Tincture of belladonna, colchicum, digitalis, gelsemium, hyoscyamus were formerly 15 per cent. are now 10 per cent. Three potent tinctures have been doubled in strength, namely cantharides, capsicum, and strophanthus, which were formerly 5 per cent. and are now 10 per cent.

A welcome *change in weight* is that of glycerin suppositories from 6 grammes to 3 grammes each. Another change in strength is that of syrup of iodide of iron from 10 per cent. to 5 per cent.

In regard to *processes*, the direction which was given by the Pharmacopœial Convention to adopt general formulas as far as possible, does not seem to have been carried out to any great extent. As a consequence 56 pages are taken up with processes for making fluid extracts, which would seem to be about 50 pages more than was really necessary. A general formula for preparing a few of these extracts would have sufficed, the menstruum to be employed in the making of the remainder is all that need have been given. Surely pharmacists in these days know how to make these preparations uniformly if the material and menstruum be given to them.

In regard to percolation, the changes made are in the way of improvement. The directions about sifting the drug previous to packing in the percolator are too often overlooked. The rate of flow is made much slower, ranging from 2 to 15 drops a minute according to circumstances.

I have spoken of those points in the new Pharmacopœia which seem to me the most noteworthy so far as I have come across them. I have not been able to examine the work thoroughly, but I have no hesitation in saying that the eighth Revision of the United

States Pharmacopœia is the best that has yet appeared, and that it is by all odds the best in the English language. There are a little more than 100 pages of most valuable matter that I have not yet been able to more than glance at. These are the tests, reagents, test solutions, volumetric solutions, directions for gasometric estimations and for alkaloidal assay, etc., followed by a number of tables of very great practical value in the laboratory, saving much time and calculation, and useful for many purposes. Too often this part of the Pharmacopœia is ignored, not, however, by scientific pharmacists.

I note with regret one omission, namely, the mention of the pharmacopœial preparations. It is a convenience to students to know what preparations are made from each drug, and if the Pharmacopœia is to be popular among physicians, as is most greatly to be desired, it would be acceptable to them to see at a glance what form of a remedy is official, that they might prescribe it accordingly. However, the general excellence of the work is such, and the difficulties of doing what has been done were so great, that, I think, words of commendation rather than of fault-finding should be given to the Committee of Revision, for they surely have done a great work.

BENJAMIN FRANKLIN.

HIS INFLUENCE ON THE PROGRESS OF THE SCIENCE OF MEDICINE IN AMERICA.

By M. I. Wilbert,

Apothecary at the German Hospital, Philadelphia.

In looking back over the 200 years that have elapsed since the birth of Benjamin Franklin we must, of necessity, be impressed by the ever reappearing evidence that this printer philosopher of Philadelphia has left the impress of his theories and of his accomplishments on practically every phase of our present-day existence.

The long and eventful career of this early American scientist, extending from January 17, 1706, to April 17, 1790, a period of 84 years, appears like one continuous recitation of important occurrences. Even his humble beginning as an apprentice, in the printing office of his brother, in Boston, was not devoid of influence on the course of events in the Massachusetts colony.

It will not be necessary for me, however, to recount to you the various incidents in the career of this noted American, nor to call to your attention the numerous and the varied achievements that have had such an evident and such a lasting influence on the government, the industries and the arts of this country, as these are matters of general knowledge and are, or at least should be, familiar to you all.

While the political, philosophical, literary, mechanical and philanthropic achievements of Benjamin Franklin have been generally recognized, it does not appear to be so commonly known that this same Benjamin Franklin probably had a more direct and a more lasting influence on the progress of the science of medicine, in these United States, than any one other individual; certainly more than any one other layman.

In the course of my remarks I shall endeavor to recall to your minds at least some of these varied influences and to indicate how far-reaching have been the ultimate results.

Being ourselves primarily interested in the practice of pharmacy we may naturally ask what influences, if any, can Benjamin Franklin have exerted on the evolution of an art that was practically unknown in this country, in his time.

Apart from the fact that he himself contributed materially to introduce the practice of pharmacy into America, his influence, indirect though it be, on the origin and development of pharmaceutical education is probably most interesting.

All of you know how directly our present system of pharmaceutical education is dependent on the system of teaching introduced by the Philadelphia College of Pharmacy, some eighty-five years ago; but do you also appreciate that the direct incentive for organizing this College of Pharmacy was given by the University of Pennsylvania, the direct outgrowth of the College of Philadelphia, founded by Franklin about the middle of the eighteenth century?

The founding of the College of Philadelphia was, however, but one of a series of important occurrences that have contributed materially to enhance and to enlarge the sum total of medical knowledge.

Five years before the founding of the College of Philadelphia was actually accomplished, Benjamin Franklin had succeeded in establishing, in the city of Philadelphia, a society "for promoting useful

knowledge among the British Plantations." This society subsequently developed into the still existing "American Philosophical Society," and while it is true that it was probably the successor of Franklin's well-known Junto, established in 1827, there can be no doubt that the membership and the objects that were sought to be attained were more evidently of a general scientific character, rather than social or literary.

While it must be admitted that there is little or no evidence to show that the meetings of this society were regularly continued, they were, as Franklin himself has stated, "for the most part held occasionally at their own expense" and by far the greater portion of the practical work was done by correspondence.

From a letter written by Benjamin Franklin to Dr. Cadwallader Colden, of New York, in 1744, it would appear that the discussion of matters pertaining to medicine was expected to take an important part in the deliberations of this society. The list of active members, included in this letter, is headed by Dr. Thomas Bond, as physician, and also includes Mr. John Bartram as botanist and Dr. Phineas Bond as general natural philosopher.

Among the objects to be attained by the "American Philosophical Society," as outlined by Benjamin Franklin, in the proposal published under date of May 14, 1743, we find: The discussion of new methods of curing and preventing diseases, . . . the study of new-discovered plants, herbs, trees and roots, their virtues, uses, etc., . . . as well as the study of "all philosophical experiments that let light into the nature of things, tend to increase the power of man over and multiply the conveniences or pleasures of life."

Probably the most far-reaching as well as the most directly important contribution by Benjamin Franklin to the progress of medicine in America, is to be found in the part he took to establish the still existing Pennsylvania Hospital.

Undoubtedly the best available description of the inception and inauguration of this now venerable institution is to be found in Franklin's inimitable Autobiography. Here he relates how his particular friend, Dr. Thomas Bond, had conceived the idea of establishing a hospital, but that owing to a lack of appreciation of the uses of such an institution, on the part of the citizens of Philadelphia, little or no progress had been made.

Franklin further relates how he succeeded in awakening an interest

in the project and how, by the introduction of political strategy, he was able to secure from the members of the Assembly of the Province of Pennsylvania the provisional grant of a considerable sum of money to be applied to the founding, building and furnishing of the new institution.

This provisional grant by the Assembly was in turn used as an incentive for the citizens to increase their contributions and thus worked both ways.

Benjamin Franklin, in addition to being instrumental in founding the Pennsylvania Hospital, also acted as clerk to the Board of Trustees, for a number of years. In this latter capacity he prepared and published a history of the hospital "From its first rise to the beginning of the Fifth Month, called May, 1754." This history was designed to bring the institution to the attention of prospective contributors and appears to have been considered useful in this respect, as it was reprinted on several occasions, the last time in 1817.

So far as known this also appears to be the first attempt to record the history of an institution of this kind and may be considered as being the first history of medicine written or printed in the United States.

This brings to mind, too, that Benjamin Franklin appears to have been one of the first, if not the first, publisher of medical books and pamphlets in the British Colonies. As early as 1734 he published an edition of the "Poor Planter's Physician," under the title of "Every Man His Own Doctor, or the Poor Planter's Physician. Prescribing plain and easy means for persons to cure themselves of all or most of the distempers incident to this climate, and with very little charge, the medicines being chiefly of the growth and production of this country." This book was probably written by John Tennent and originally printed at Williamsburg. It was subsequently reprinted in several forms and also translated into German.

Among other medical publications from the press of Benjamin Franklin we find:

"An Essay on the Iliac Passion" by Dr. Cadwallader Colden, in 1741.

"An Essay on the West India Dry Gripes, with the method of preventing and curing that cruel distemper," by Dr. Thomas Cadwalader, 1745.

"A letter to a friend; Containing remarks on a discourse propos-

ing a preparation of the body for the small pox. And the manner of receiving the infection," by Dr. John Kearsley, 1751.

"Medicinae Britannica." "To which Mr. John Bartram has added a preface, notes, and an appendix containing a description of a number of plants peculiar to America, their uses, virtues, etc."; also printed in 1751.

Throughout his long and varied career Benjamin Franklin appears to have had a predilection for the friendship of medical men. In addition to the brothers Thomas and Phineas Bond, Benjamin Franklin probably counted as friend or correspondent every prominent medical man in the British Colonies. In Great Britain itself Franklin's friends were numerous and influential. He was on intimate terms with such prominent men as John Fothergill, Sir William Watson, Sir John Pringle, William Heberdeen, William Hewson, Thomas Percival, William Cullen and Joseph Black. In France and on the Continent of Europe Franklin was known to, if not by, every prominent medical man who was in any way interested in the progress of the general sciences.

Through this wide and varied acquaintance with medical men of all parts of the civilized world Franklin was able to, and did, assist a number of American students of medicine who had gone to Europe to complete their medical education. Not the least noteworthy of these several students was John Morgan, a son of Evan Morgan, a merchant of Welsh descent, who had been a friend and neighbor of Benjamin Franklin, and had also been associated with him as a member of the Board of Trustees of the Pennsylvania Hospital.

John Morgan, after serving as an apprentice in the office of Dr. John Redman, was appointed and served one year as the second apothecary of the Pennsylvania Hospital; Morgan subsequently went to Europe, where, largely through the kindly assistance of Benjamin Franklin, who was then residing in Europe as the agent of the Pennsylvania Colony, he was brought in contact with and permitted to study under the leading men of the medical profession in London, and later in Edinburgh. It was no doubt due to his associations in the latter city that Morgan was led to conceive the idea of forming a medical school in connection with the College of Philadelphia, and at the same time to attempt to introduce the then novel practice of writing prescriptions and of having them compounded and dispensed by a regularly educated apothecary.

The medical school founded by Morgan, in addition to acting as an incentive for the establishment of other schools, has itself taken a most important part in the progress of the science of medicine in this country, and, as noted above, was also the direct incentive that led to the establishment of schools of pharmacy.

From a modern point of view it might be asserted that at least some of the practices of Benjamin Franklin were not to be condoned. You are undoubtedly aware of the fact that Franklin was probably the originator of the modern type of department store; certain it is that he was one of the first to give publicity to the wares he chanced to have on hand and that these commodities varied from needles and pins to horses and slaves.

Not the least remunerative among this varied stock of merchandise were tea, coffee, spices, patent medicines and household remedies.

In looking over the advertisements in the earlier numbers of Franklin's Gazette, or more properly, *The Pennsylvania Gazette*, we find that he offered for sale: "Choice Bohea Tea, Very Good Coffee, Very Good Chocolate, Fine Palm Oil, Very Good English Saffron Very Good Spermacety, Crown Soap, The True and Genuine Godfrey's Cordial, and Senaka Rattle Snake Root, with directions how to use it in the Pleurisy."

This latter advertisement is particularly interesting as it illustrates the interest manifested by Franklin to introduce and to advocate the use of indigenous remedies.

That Franklin himself aspired to some knowledge of the art of medicine appears from many of his letters, and it is not at all improbable that he, from time to time, recommended sundry remedies to his associates and friends and thus became guilty of what would now be considered "counter prescribing."

Franklin was, however, more than a mere dealer in drugs and medicines, he was a staunch and a very ardent advocate of hygienic measures of all kinds and in this one respect, at least, was very far in advance of his times. He constantly and persistently advocated cleanliness, sobriety and fresh air, and many are the tales told by himself and others about unexpected experiences and marked differences of opinion. Franklin's advice to insist on a constant supply of fresh air in your bed chamber is said to have been accompanied by the assurance that "no outward air that can come in to you is so unwholesome as the unchanged air, so often breathed, of a close chamber."

Franklin was also very fond of water; he himself tells us how, as a journeyman printer in London, he attracted considerable attention by his skill as a swimmer, and how later in life he was able to cure himself of a cutaneous trouble by repeated bathing. In later years, he is said to have derived great benefit from the use of hot or warm baths which he took in a specially constructed bath tub or bathing machine.

Benjamin Franklin's connection with the then newly introduced practice of inoculating for smallpox is another instance of his far-sightedness, and one for which he should be duly credited.

We of the present day cannot appreciate the havoc and consternation that was wrought by this dread disease two centuries or more ago.

The American colonies appear to have been particularly susceptible to periodic visitations of malignant smallpox, and historians tell us that not alone did the disease spread with alarming rapidity, but that the accompanying mortality, in nearly all of the recorded epidemics, was extremely high.

Dr. Zabdiel Boylston, a noted practitioner of Boston, introduced the practice of inoculation into that city as early as 1721. In this he met with considerable opposition by all classes of people, and the practice itself spread so slowly that for nearly a decade it appears to have been confined to Boston and its immediate vicinity.

In 1730 smallpox was epidemic in Philadelphia, and at least several of the physicians of that city decided to try the practice of inoculation. The interest that Franklin took in this practice is evidenced by the tone of the following clipping from *The Pennsylvania Gazette* of March 4, 1730.

"The practice of inoculation for the smallpox begins to grow among us; J. Growden, Esq., the first patient of note, is now upon recovery, having had none but the most favorable symptoms during the whole course of his distemper, which is mentioned to show how groundless all of those reports are that have been spread through the Province to the contrary."

Quite a number of other notices of similar tone are to be found in the *Pennsylvania Gazette* during the years that it was published by Franklin, and it is evident everywhere that Franklin took an active part in the popularization and spread of the practice.

In 1759, while in England, Franklin wrote, for Dr. William Heberdeen, an account of the practice of inoculation for the small-

pox as practiced in Boston about 1753 or 54. In this account he mentions the great disparity in the mortality of those who took the smallpox in the common way and those who received the distemper by inoculation, despite the fact that the deaths of those inoculated had been distinctly more numerous in proportion at this time than had formerly been observed.

The practice of inoculation served to prepare the way for Jenner's discovery of the relationship existing between cowpox and smallpox and the accompanying practice of vaccination which has so effectually reduced the frequency as well as the dread of this one-time fearful scourge.

One other contribution of Franklin to the science of medicine should be mentioned in this connection. This is the part he took, as a member of the Royal Commission appointed by the King of France, in 1784, to inquire into and report on the claims of Mesmer and his practice of Animal Magnetism.

This commission consisted of four of the leading physicians of the faculty of Paris, and five members of the Royal Academy, of which Benjamin Franklin was the first to be appointed.

Mesmer had come to Paris from Vienna, in 1778, and soon acquired considerable popularity. The resulting frenzy and abuses finally became so serious that the Government was virtually compelled to interfere and the above-mentioned Royal Commission was instituted. The report that was subsequently issued by the Government appears to have been a humorous one, but nevertheless served to give the peculiar conglomerate of fraud and folly such a destructive blow that during the lifetime of Mesmer, at least, it was not heard of to any material extent.

Altogether it may be said of Benjamin Franklin that in matters medical, as in matters political or scientific, he was, as a rule, far ahead of his contemporaries, either as the originator of ideas and innovations, the disseminator of useful knowledge, or the promoter and the champion of practices and teachings which his foresight and experience had taught him to be useful and beneficial.

In conclusion it is probably not too presumptuous to assert that with the passing years Franklin's true merit and worth will be more duly appreciated, even in America, and he will eventually be given the credit of being, as he really was, one of the foremost men of his age.

IS THE USE OF FOOD PRESERVATIVES JUSTIFIABLE?

By Horatio C. Wood, Jr.,
Demonstrator of Pharmacodynamics, University of Pennsylvania.

There are two sides to most questions, and before we make a judgment in the case of "The People versus the Food-Preservatives" we should hear the side of the defendant. Under the conditions of modern civilization it is frequently necessary to transport perishable food long distances between the farmer and the city consumer, and it is urged that the use of antiseptics makes it possible to accomplish this without the food undergoing such putrefactive changes as would render it unfit for nutriment. There can be no doubt, of course, that decayed food is unwholesome and any means of preventing decomposition which is not of itself deleterious to the health is certainly to be most eagerly welcomed by every one; but when an extraneous substance is added to a food-stuff the burden of proof as to its innocuousness rests on the innovator.

Leaving aside for the moment, however, the question of the possible harmfulness of antiseptics, there is one point to which I wish to call attention, and that is the illogical position which is taken by the advocates of food-preservatives, who are mostly persons financially interested in their use. If the users of these embalming fluids are so firmly convinced, as they claim to be, that more wholesome food can be furnished by the use of disinfectants, why are they so actively opposed to letting the world know that they employ them? If I make a pair of shoes in which a new process of tanning is employed that I am convinced gives a better grade of leather than any other process, I certainly should not attempt to hide the fact of this innovation but should lay stress upon it as a recommendation of my wares. Whenever we see a business making vigorous efforts to prevent publicity of its methods the words of the great Teacher are bound to come to our minds, that "men love darkness rather than light because their deeds are evil." There is to my mind no more convincing argument against the use of food-preservatives than the opposition of their advocates to such a legislative measure as the Heyburn Bill, now before the United States Congress.

The statement has been made and repeated that it is impossible to produce wholesomely pure food without the use of antiseptics; but this is mere buncombe. The housewife does not require a bac-

teriologist to prove to her that fruit thoroughly cooked and hermetically sealed will keep indefinitely. Perhaps the most perishable food used in large quantities is milk, and yet it is a fact to-day that in such a large centre of population as Philadelphia, purer milk can be bought than our fathers drank on the farm. Of course it costs to transport milk the necessary distance and have it arrive in good condition without the use of preservatives; but this is beside the question, for the philanthropists who advocate the use of food-preservatives lay no stress upon the money which they save, but talk only of the benefit to the national health.

A recent writer in defending the use of preservatives draws a vivid picture of the disaster to health from eating meat that because of the lack of pickle has reached the market in a most advanced stage of decomposition yet outwardly retaining sufficient appearance of wholesomeness to be salable. This dramatic conception, painted sufficiently lurid to spoil our appetite for all unadulterated pabulum, fades into insignificance, however, in comparison with the facts proven by C. D. Harrington, of Boston, who has shown that by the use of sodium sulphite, meat containing five billion bacteria per gramme could be made to look like fresh meat and the odor of decomposition so covered up that an ordinary customer might be induced to buy this putrid mixture of rotten flesh and sodium sulphite under the delusion that he was purchasing food.

Personally I am not certain of the advisability of legislation at the present time prohibiting the use of all food-preservatives, but I most emphatically do believe that those manufacturers or dealers who use food-preservatives should be made to say so. If I am going to take a daily dose of borax, or of sodium sulphite, or of formaldehyde, I want to know it, and I believe I have a right to know it. If the user of food-preservatives is convinced that my system needs borax or formaldehyde let him show me in what way they will benefit and then tell me the amount that his preparations contain, and perhaps I will eat them. If borax and salicylic acid have a wholesome effect upon the economy let the people but know when they are using these antiseptics and they will soon discover for themselves their beneficent properties.

But I believe there is little room for doubt but that the continued reveling in chemical fare exercises a baneful effect upon the body. Certain it is these disinfectants are not proven harmless. But be

they beneficial, or be they harmful, I maintain that the customer has a right to know whether or not he is eating antiseptics, and I believe that any dealer who sells as a pure food one which contains a preservative is as dishonest as he who sells the gold brick to an innocent hayseed.

There is, however, another and more profound question involved and that is the responsibility of the Government for the health of the people. Our legislators at least make a pretense of protecting us against those who would take our lives or our money, why should they not equally protect us against those who would rob us of health? It is not enough to force dealers to truthfully label their food products, for the great mass of the people are not capable of making a judgment as to the danger of adulterated foods. It would be equally as sensible for the State to hold a pharmaceutical examination and then say, "Anybody may practice pharmacy who wishes to, but we will tell you who has passed our examination." It is clearly the duty of our legislators to decide as to the permissibility of chemical preservatives, and if they show a disinclination so to do it is clearly incumbent on us to see that our law-makers perform their duty.

In closing I wish to plead for an active interest in the Heyburn Pure Food Bill now before the United States Congress. To pharmacists and physicians this measure is of especial interest because it provides not only for the purity of foods but also of drugs. The duty of furthering the passage of this bill devolves to a large extent on these two professions, and while it may not be all that could be desired it is certainly a step in the right direction and it behooves us therefore individually and collectively to do all that we can for its passage.

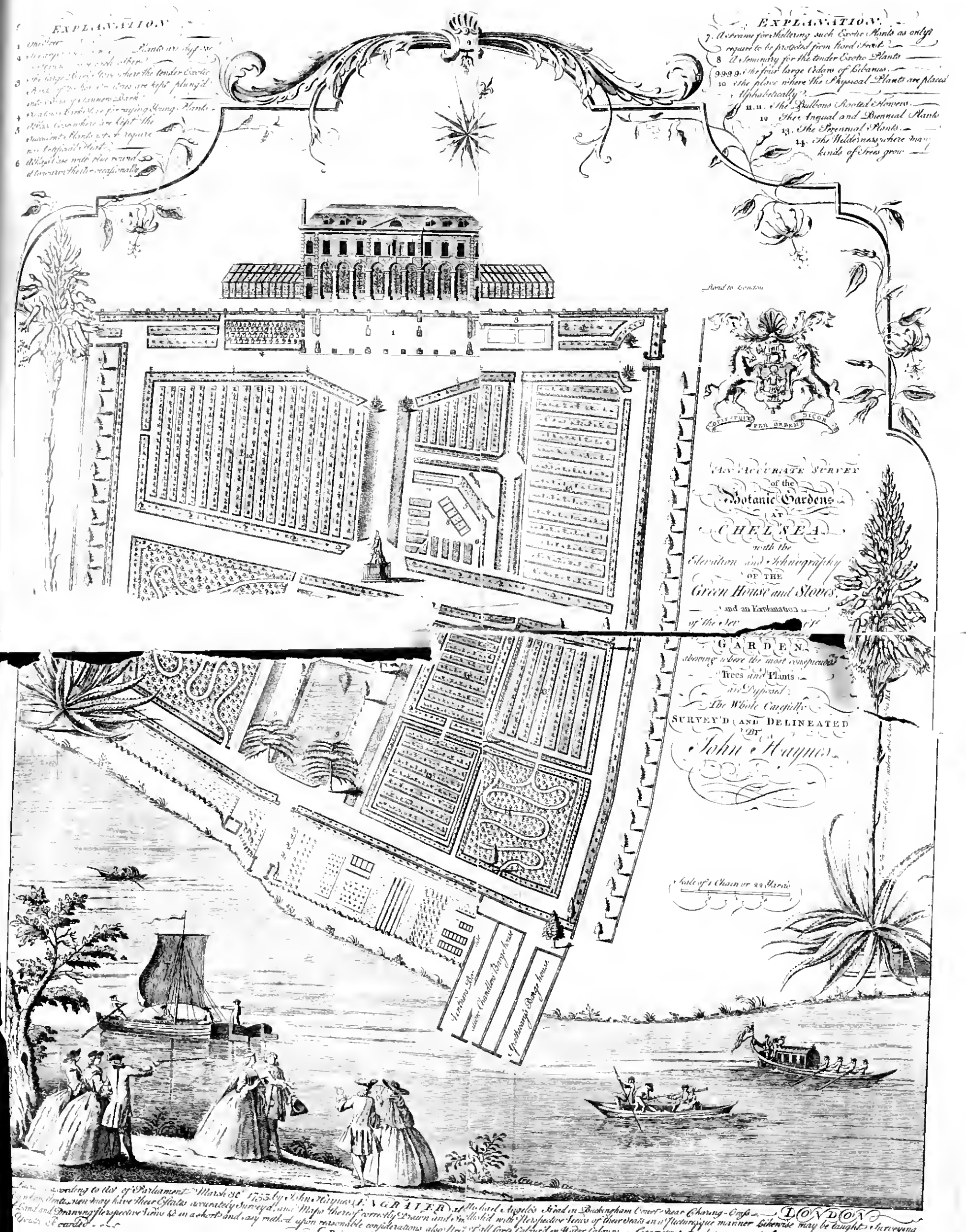
LONDON BOTANIC GARDENS.

By Pierre Élie Félix Perrédès, B.Sc., F.L.S.,
Pharmaceutical Chemist.

A Contribution from the Wellcome Research Laboratories, London.

(*Continued from p. 183.*)

Through Philip Miller's exertions the garden continued to prosper, and we learn from a committee report of 1750 that it had been carefully examined in that year by the members of the com-



according to Act of Parliament March 30 1753 by John Haynes ENGRAVER at Michael Angelo's Head in Buckingham Court near Charing-Cross LONDON
men may have their Estates accurately Survey'd, and Maps thereof correctly Drawn and Embellish'd with Perspective Views of their Seats in a Picturesque manner Likewise may be taught Surveying Land and Drawing Perspective Views &c in a short and easy method upon reasonable considerations also Plans of all sorts Colour'd in Water Colours Geometry Architecture and Geography Carefully Taught and Youth Boarded
(Price 2 6 plain and 5 Colour'd)

mittee and found to be in very good order. The expenses of the garden, however, were also increasing, and the strain upon the Society's resources became so great that the Master and Wardens in 1753, the year of Sir Hans Sloane's death, consulted the President of the Royal Society on the subject, but apparently without result. The difficulty was, nevertheless, tided over, and, after 1770, the expenditure continued to advance steadily. During Lindley's tenure of office as Professor and Director it became more than doubled, and ultimately proved too great a burden for the Society to bear In 1853 economies were effected which will be considered presently, and, in 1860, the Royal Society and the Royal College of Physicians were both approached by the Society of Apothecaries with a view of surrendering the 'garden to one of them. The offer was refused by these bodies, and it was not until 1898 that the Society was able to free itself from the garden and to pass it over to other hands.

The following is an epitome of the principal improvements carried out in the garden during the period which we have just considered: In 1771 the garden was embanked on the river side to reclaim ground that had been encroached upon, and in the following year a rockery was constructed from materials presented by Stanesby Alchorne, John Chandler and Sir Joseph Banks. In 1787 a quantity of loam was brought from Sion and "black mould" from Wimbledon, and shortly after the appointment of William Anderson in 1814 it is once more on record that the garden was in excellent order. This satisfactory condition of things appears to have occurred periodically with the advent of a young and energetic gardener, and to have waned with the advancing age of the latter. We accordingly find that when Lindley became Director of the Garden he reported it to be in a very unsatisfactory condition, and it was only by bringing considerable pressure to bear on Anderson that comparative order was restored. During Robert Fortune's short tenure of office as gardener (1846–1848) improvements were energetically prosecuted, and this policy was continued by his successor, Thomas Moore, until 1853; but between the latter date and 1862 the garden went from bad to worse, owing to insufficient funds. A slight revival took place in 1863, but the garden was in a moribund condition, and after Thomas Moore's death there is nothing of importance to record until its transfer to other hands. In 1870 the construction of the Chelsea embankment was contemplated by the Metropolitan

Board of Works. By mutual agreement between the Board and the Society, the latter lost the foreshore of the garden as well as access to the river, but obtained certain benefits in return, including the present wall, railing, and main gates which face the embankment. Turning now to the particulars of the plant houses and other buildings, we find that the greenhouse, erected in 1732–34, was in 1747 already in need of repairs, and with the assistance of a contribution from Sir Hans Sloane these were duly carried out. In 1779 a new small stove was built to take the place of an old one, and we learn that in 1785 the greenhouse required *slating*, as well as other repairs to *glass lights.* The expenses involved in this work were defrayed by subscription among the constituents of the Society. Two new stoves were erected in 1789, a new tan-pit in 1790, another in 1791, and a new dry stove in 1792, to take the place of a ruined one. Several alterations were begun in 1815 and completed in the following year. These included improved heating arrangements, which involved the addition of a room behind one of the greenhouses to provide sleeping accommodation for the gardeners, in order that the latter might be near the fires. A pump for Thames water was also provided in the same year, as the spring water which had hitherto been used was said to be injurious to the plants. The improvements carried out during Fortune's curatorship comprised "two new span-roofed glass structures, a stove and a greenhouse." In these the "Polmaise" or hot-air system was tried, but found unsatisfactory, and two years later heating by hot water was substituted in its stead. The expense was met, as usual, by subscription among the members and by a grant from the Corporation. In 1853 one of the glass houses was taken down and sold, but one stove was retained, for although it had been proposed to suppress artificial heat altogether in the houses, it was found that some "medicinal plants which were absolutely necessary required heat."[1] In 1863 the plant-houses were re-arranged and new ones constructed, and into some of these Wardian cases were introduced. It was not until the new *régime*, however, that the hothouse collections became at all considerable in extent.

The only other buildings of sufficient importance to be considered here are those which served as a residence for the gardener or cura-

[1] Cf. Barrett's "History of the Society of Apothecaries," from which the above statement is quoted.

tor. Apartments in the greenhouse were provided for the gardener almost from the first. In 1761, however, Philip Miller made the request that he should be provided with a dwelling in the garden, so that the rooms in the greenhouse were evidently no longer habitable, and it is not until the appointment of William Forsyth as gardener in 1770 that we hear of "lodging-rooms in the greenhouse" being provided once more. John Fairbairn, on his election to the office of gardener, in 1784, was directed "to make the apartments over the greenhouse his residence," and his successor, William Anderson, was granted "the usual apartments for his residence." The construction of a sewer in 1853 rendered the building unsafe, and a new house for the curator was erected on the site of "the old lecture-room."[1] This new building remained until the surrender of the garden by the Society of Apothecaries.

It will not be without interest at this point to refer briefly to the barges and barge-house which figured prominently in the early history of the garden, although the matter is of no botanical interest. Three barges were successively owned by the Society. The first was built in 1675, the second in 1727 and the third in 1764. This last was sold in 1817. Between 1717 and 1727 the apothecaries were without a barge, and they accordingly "entered into treaty with the Stationers' Company for their barge-house at Chelsea."[2] In 1818 the barge-house "was let on lease to Mr. Lyall, of the Swan Brew-house, for twenty-one years," and after his tenancy no more is heard of it.

The steps taken to form a library and herbarium in connection with the garden may also be conveniently considered here. The first indication of the Society's intention to form a library for the

---

[1] This formed part of the same building as the old greenhouse and residence of the curator, the whole constituting the "Green House" erected in 1732-4, and indicated in Plate XXV by figure "1." The building is also seen in the distance through the gateway in Plate XXIII.

[2] The references to this barge-house in Henry Field's "Memoirs" and in Mr. Barrett's work are very confusing. It is certain, however, that more than one barge-house was owned by the Society, inasmuch as two barge-houses, in addition to the one which the Society itself occupied, are mentioned in the Society's records, and details are given in latter of various agreements relating to the tenancy of the houses by the Tallowchandlers', Weavers', Coopers', Vintners' and Goldsmiths' companies. The existence of these three barge-houses is further confirmed by the old print reproduced on Plate XXV.

garden is found in one of the Society's minute books under the date of October 6, 1681, where it is recorded that it was then determined to "contrive a library" for the use of the laboratory and garden.

Samuel Dale, a member of the Society,[1] who died in 1739, left a legacy of books and dried plants to the Society on condition that the Master and Wardens should, within twelve months after his decease, "make or erect proper conveniences in their Physick Garden at Chelsea, for the reception thereof." Presses were accordingly made for their accommodation, and an inscription was placed over the collection to indicate that it was the gift of Dr. Dale.[2] The collection of books in the Chelsea Garden was increased in 1744 by the addition of a number of botanical works, the gift of the executrix of Isaac Rand. From a catalogue prepared by Stanesby Alchorne in 1769, it appears that there were in that year at the garden 266 books, mostly on botanical subjects, and about 50 unbound books and pamphlets. According to this same catalogue, there were also 238 volumes in the older library at the Apothecaries' Hall, but many of these had originally formed part of the garden library, and had been removed to the hall on various occasions. This process seems to have continued until the whole of the collection of books at the garden became absorbed by the Hall Library, for it was found necessary in 1863 to furnish "the rooms of the assistant gardeners with suitable books and specimens for the instruction of these officials."

---

[1] This is on Field's authority, but Prof. G. S. Boulger, in an able account of Dale contributed to *The Journal of Botany*, Vol. XXI (1883), pp. 193–197 and 225–231, has shown that the statement is probably incorrect. Professor Boulger says: "He was apprenticed on the 5th of May, 1674, as the 'son of North: Dale of ye parish of St. Mary Whitechappell in County Middlsx. silk-thrower . . . to Thos. Wells for 8 yeares;' but as he seems never to have practised as an apothecary in London it was not necessary for him to take out his freedom as a member of the Society of Apothecaries, and he seems never to have done so."

[2] "In the *Gentleman's Magazine* he is described at his death as Dr. Samuel Dale, F.R.S.; and many notices of him speak of his being a Licentiate of the Royal College of Physicians. He, however, seems never to have received or used the title of M.D.; his name does not occur in Dr. Thomson's list of the Fellows of the Royal Society, nor in that by Dr. Munk of the Licentiates of the College of Physicians. There is, in fact, no reason to suppose that either of these three titles has been rightly applied to him."—Boulger, *loc. cit.*, p. 229.

Dale's herbarium was supplemented in 1745 by a donation of 12 volumes of dried plants from Robert Nicholls. These were deposited in the greenhouse, and, in 1748, 22 similar volumes were presented to the Society by Joseph Miller's widow. Isaac Rand's herbarium was also bequeathed to the Society, and in 1759 Mrs. Rand gave a sum of £100 to be held in trust for its repair. That is to say, two-thirds of the annual interest was to be paid to the Demonstrator for the time being "for placing twenty newly dried specimens of plants yearly, in her late husband's collection, in room of such as might be decayed," while the remaining third of the interest was allotted "to the Master and Wardens for seeing it done." In Stanesby Alchorne's catalogue of 1769 the *Hortus Siccus* of Joseph Miller was stated to consist of 20 volumes. A "bundle of dried plants," the gift of John Wilmer, is also mentioned in this catalogue, but there is no reference in the latter to Isaac Rand's collection. William Hudson bequeathed his herbarium to the Apothecaries' Society at his death in 1793. In 1806 this collection was presented to Thomas Wheeler, who was then Demonstrator of Plants, and, finally, in 1862, the whole of the herbarium specimens at the Chelsea Garden was presented to the trustees of the British Museum. The most important of these collections is undoubtedly that of Samuel Dale, owing to the fact that it contains the original herbarium of John Ray, who had bequeathed it to his friend Dale.

Having now considered the main features of interest in the *matériel* of the garden under the Society's rule we may conclude this first section by amplifying our account of the administration of the garden during that period.

It has already been stated that when the Society of Apothecaries came into complete possession of the garden in 1722, a special committee was appointed to administer the latter. This committee originally consisted of the Master, the two Wardens and nine other members of the Court of Assistants. The same constitution as to number of members obtained until 1776, but in 1752 three of the members were ordered to be changed every year. In 1776 the Court of Assistants directed that every member of that court who had served the office of master should be a standing member of the Garden Committee. The number of members on this committee was further increased in 1784 by the addition of three members of the Livery, and this appears to have been the last change made in the

constitution of the Garden Committee. The services of the members of the committee were, so far as can be ascertained, gratuitously rendered at first, but in 1776 it was directed that each member should be allowed five shillings for every attendance. Refreshments were also provided at the Society's expense, and, in 1780, the sum of £5 was fixed as the allowance for refreshments at each meeting. In 1810 the regular meetings were ordered to be held in April, June, August and September, and the "refreshments" at the meetings eventually took the form of dinners held in the garden. In 1853 both the fees and the dinners were abolished, and even the Garden Committee itself ceased to exercise its functions for a time. Indeed, although the Garden Committee is said to have resumed its proceedings after a short interval, there is little evidence to show that it was in existence until 1862 when it was galvanized into a semblance of life, chiefly through the efforts of Nathaniel Bagshaw Ward. After Ward's death in 1868 we again look in vain for evidence of life in the Garden Committee, and most of the administrative work appears to have been undertaken by the Court of Assistants.

The rules framed by the governing body for observance by the Demonstrator of Plants and *Præfectus Horti* are among its most important enactments, and we will now proceed to consider them. The duties of the office of Demonstrator of Plants had, as we have seen, been defined in general terms on the appointment of Isaac Rand to that office in 1724, but it was not until 1773, when William Curtis was elected to the post, that these duties were set forth in detail. This set of instructions has already been referred to elsewhere, and several of its clauses have been dealt with in detail. The terms of the remainder still remain to be considered, and were as follows:—

"The office of Botanical Demonstrator to this Society, is to superintend their garden and gardener, as also their library, and all other matters upon their premises at Chelsea; but with submission always to the superior direction of the General Committee for the management of the Society's Garden. His duty is to encourage and cultivate the knowledge of Botany, theoretic as well as practical, among the students of this Society; for which purpose,

"—— He is to attend the Society's Garden at stated times, not less than once in every summer month, (from April to September, both inclusive) to demonstrate the plants, especially in the officinal

quarter, with their names and uses. The last Wednesday in each of the above months has been usually appropriated to this service, beginning at nine of the clock in the morning.

"—— He is yearly to prepare fifty dried specimens from plants, growing in the Society's garden at Chelsea, which are to be presented to the Royal Society, by direction of the late Sir Hans Sloane, Bart. having been first approved by the Court of Assistants of this Society. Also to dry twenty other specimens, in lieu of so many plants which shall be found decayed in the collection of the late Mr. Rand, now in the library at Chelsea. These to be placed in the said Herbarium before the first day of May in every year, and there will be fifty shillings paid him for every such service, by appointment in the will of the late Mrs. Rand."

The rules of 1773, with the exception of the last-mentioned paragraph, do not seem to have undergone any alteration until the election of James Lowe Wheeler as Demonstrator and *Præfectus* in 1821, when some slight amplifications were introduced. The Demonstrator was required, as in the minute of 1773, to give demonstrations in the garden on the last Wednesday of each summer month, but it was further stipulated that he should on each such occasion, or on other occasions if so directed, employ some time "in explaining to the students the systems of Botany, both Sexual and Natural, as taught by Linnæus and Jussieu; together with the principles of vegetable life, and the Structure, Physiology, and Medical Virtues of Plants, their Natural Climate, the alterations produced by culture, and the parts of them employed whether medicinally or as food for man and other animals." With the exception of a few other suggestions, however, the new instructions were substantially the same as the old ones. But a new order of things was being created by the Act of 1815, in that membership was not incumbent upon the new licentiates of the Society, and these unaffiliated licentiates, as well as students preparing themselves for the license, were rapidly increasing in numbers. The demonstrations and herborizings, however, were confined to members or their apprentices, so that this growing class of students and qualified non-members was placed at a considerable disadvantage. The advisability of remedying this state of things gradually impressed itself on the members of the Garden Committee, and, in 1829, it was suggested by them that the garden might be made more useful to the profession gen-

erally than it had hitherto been. They recommended that the garden should be opened weekly on Fridays between 9 and 11 in the morning, dating from the third of July of that year, "to all such Medical Students as were pupils to the established Professors and Tutors in the Metropolis in Medicine, Chemistry, Materia Medica, or Botany." This was accordingly done, and a ticket of admission was issued to every metropolitan medical student who brought a letter of recommendation from his teacher. More than 100 pupils having taken advantage of the facilities offered to them by the Society, the Garden Committee in December of the same year presented a further report to the "Master, Wardens, and Assistants of the Society of Apothecaries" embodying the following recommendations:—

"That the Garden be open every Wednesday during the months of May, June, July, August, and September, from 9 o'clock in the morning until 12 at noon, and that admission be given to all such medical students as are pupils to the established professors and lecturers in the metropolis, whether in Medicine, Chemistry, Materia Medica, or Botany, and also to the Apprentices of the several Members of the Society.

"That there be every week a demonstration of all the plants contained in the Materia Medica department of the Garden, and of such other plants as the Demonstrator may think proper. Such demonstration to commence at 10 o'clock punctually, and that after such demonstration is finished there be a lecture delivered by the Demonstrator in some part of the building attached to the Garden, upon one or more of the following subjects, so as to form during each summer season a regular Course of Botanic Study, namely,—

"(1) The different systems of Botany, both natural and artificial, particularly those of Linnæus and Jussieu.

"(2) The Structure and Growth of Plants.

"(3) The different parts of Plants, with their description and uses in the process of Vegetation.

"(4) The natural and chemical analysis of vegetable matter.

"(5) The medicinal uses of the most important articles in the Materia Medica, with observations on the best modes of preparing them. These remarks may be made either at the lectures or at the demonstrations, at the discretion of the lecturer.

"That the conducting these demonstrations and lectures be committed to the Society's Demonstrator of Botany, and that the monthly lectures hitherto delivered by him at the Garden be discontinued, as merging in and more effectually provided for in the lectures now proposed to be adopted. . . .

"That in consequence of the additional service occasioned by these lectures the salary of the Botanical Demonstrator be increased."

These recommendations were adopted, and the new rules came into operation in the following year. When Lindley became *Præfectus Horti* and Professor of Botany the number of lectures in the garden was increased, a lecture being delivered twice a week at 8.30 A.M. in May, June, and July, instead of one weekly at 10 A.M. from May to September. Other suggestions as to the re-arrangement of the plants and the preparation of a catalogue were also made by Lindley, and these were readily acted upon by the Society. Lindley, in a word, may be said to have dictated terms which were at once acceded to, so that the entire management of the garden was virtually in his hands until the suppression in 1853 of the office of Director of the Garden, which he was the last to hold.

We have seen that the regulations of 1773 had placed the gardener in a subordinate position. This arrangement seems to have worked smoothly on the whole until the advent of Lindley, when submission to the *Præfectus Horti* was enforced on Anderson, who was gardener at the time. After the abolition of the office of *Præfectus Horti*, the gardener, then known as the curator, was entrusted with the management of the garden, subject, of course, to the higher authority of the Society's governing body. The inadequate remuneration of the gardener seems to have been a cause of much complaint on the part of that functionary. In 1767 Philip Miller presented a memorial to the Court of Assistants showing that his expenses in connection with the garden were not covered by his salary, and a gratuity of £50 was accordingly granted to him in the following year. Forsyth, in 1774, also complained that his salary was insufficient, and, in order to supplement this, the vicious principle was introduced of allowing him to sell supernumerary plants for his own profit. Before leaving this topic there are a few other administrative matters connected with the office of gardener which merit some notice. Thus we learn that in 1744 "an order

was made that no person be permitted to gather specimens from the garden without leave from the director or gardener, and that no person whatever, who was not a member of the Society, be permitted to walk in the garden without the attendance of the gardener." It is apparent from this that the public had been admitted to the garden, and there is also evidence to show that the precautions just mentioned were taken because of some act of vandalism by a visitor. By 1786, however, the members had become so numerous that it was a difficult matter for the gardener to recognize them all, so that "an engraved card suitably ornamented, and endorsed by the Master and Wardens for the time being, was directed to be given to every present and future member, to which the gardener and his servants were to pay due regard." The importance of the gardener's services was also recognized by others besides the members of the Society of Apothecaries and the general public, for in 1815 the Horticultural Society requested that they might be allowed to make experiments in the Chelsea Garden under the control of the Society of Apothecaries and its gardener. This request was refused, but permission was accorded to the gardener to make such experiments, provided that application was made by the Horticultural Society through the Garden Committee, and a portion of the garden was accordingly set aside for "the planting of various fruit trees and esculent vegetables."

It has already been mentioned that the normal expenses incurred in administering the garden were met, as early as 1713, by the imposition of fines on the Society's constituents. It has also been shown how this arrangement was disturbed in succeeding years owing to the unsettled condition of the garden. After the transfer of the property to the Society of Apothecaries by Sir Hans Sloane the system of levying definite fees upon the Society's members was again introduced, and this, together with additional grants from the Corporation, was the method adopted during the whole period in which the garden was owned by the Society of Apothecaries. It will, further, be remembered that extraordinary expenses were met, in the early days of the garden's history, by subscriptions among the members of the Society, and by special grants from the Corporation. This system was also the one subsequently adopted on similar occasions.

The awarding of prizes for proficiency in botanical subjects is

intimately connected with the administration of the garden, and a short account of the steps taken by the Society in this direction will form a fitting prelude to the next section of our subject, namely, the Botanical work accomplished in the garden. Prizes in Botany were offered by the Society to their apprentices at least as early as 1789, but it was not until 1830 that the scope of the examinations in Botany and Materia Medica was extended so as to include external students. The recommendations of the Garden Committee adopted in 1829 have already been considered in some detail in connection with the duties of the Demonstrator of Plants. The following clauses relating to the examination of candidates and to the awarding of prizes complete the main provisions of the report in question:

"That in order to give encouragement to diligence and talent, there be an annual examination of such students as may think proper to become candidates for the prizes intended to be given on these occasions. The examinations to be upon some or all of the subjects stated in the foregoing series of lectures (see pp. 232, 233), as well as upon their skill in the nomenclature of plants. No person to be admitted a candidate who has not attended these lectures and demonstrations at least eighteen days in one summer, or thirty days in two succeeding summers, nor shall any prize be awarded unless his examination be performed to the complete satisfaction of the examiner or examiners for the time being.

"To prevent partiality or undue preference, no public professor or lecturer whose pupils are admitted to the Garden can be appointed an examiner.

"The apprentices to Members of the Society having an annual opportunity of being candidates for prizes upon the ancient establishment, cannot be admitted candidates on these occasions either during the period of their apprenticeship, or subsequently to the conclusion of it.

"That two medals, the one being of gold of ten guineas value, and the other of silver or bronze, be annually awarded to the two candidates who shall have passed the best and second best examination in manner hereinbefore mentioned, but no medal to be given unless in the opinion of the examiner or examiners the candidate shall be deemed deserving of it."

The recommendations were adopted, and, in conformity with

them, three prizes were awarded at the termination of the session in 1830; two to medical students at large, and one to the apprentices of the Society. The two examinations for these classes of students were fused into one in 1837, and a modification in the prize-awards was introduced at the same time: the best candidate was to receive a gold medal, the second a silver medal with books, and the third books only. In 1853 these prizes were discontinued, but renewed after a short interval. James Lowe Wheeler, David Don, Nathaniel Bagshaw Ward, Sir J. D. Hooker, and the Rev. Miles Berkeley successively held the post of examiner for prizes in Botany, while the following well-known names may be selected from the roll of successful candidates: Thomas Henry Huxley, Maxwell Tylden Masters, John Harley, Charles Hilton Fagge, Henry Trimen, and Henry Charlton Bastian.

[*To be continued.*]

THE INTERDEPENDENCE OF MEDICINE AND PHARMACY.[1]

BY AUGUSTUS A. ESHNER, M.D.

The province of the physician is the alleviation of suffering and so far as possible the prevention and cure of disease. In the fulfilment of these functions he has at his command divers agencies, some of a medicinal, others of a non-medicinal character. Of certain of these he can exercise entire control. In the application of others he requires the aid of experts in other departments of science and art. For purposes of diagnosis, for example, he must have instruments of precision, such as the microscope, apparatus for blood-counting, hemoglobin estimation, study of blood-pressure, urea estimation and the like. In treatment he may avail himself of various physical agencies, such as light and heat, water, air, electricity, manual procedures and mechanical appliances. Some of these he may himself devise and apply. For others he depends upon workers in other spheres of activity. So also with regard to the articles of the materia medica. The primitive physician was himself able to gather the simple herbs needed in the preparation of the infusions and de-

---

[1] Read before the Philadelphia Branch of the American Pharmaceutical Association, March 28, 1906.

coctions through whose aid he sought to bring relief. With the evolution of medicine and the gradual increase in the number and complexity of medicinal agents the practitioner of medicine has become dependent upon the pharmacist. On the former reposes the obligation of familiarizing himself with disease for the purpose of its recognition and appropriate treatment, while upon the latter devolves the duty of preparing and providing in most convenient, most palatable and most reliable form the drugs prescribed by the physician. The physician should know more or less intimately the sources of the preparations he uses and their general chemical composition, but he cannot be expected to be able to construct them for himself. The pharmacist, however, must be master of all these things, but he is exempt from the obligation of directing the employment of the remedies; it is his function to prepare. The duty of diagnosis and treatment belongs to the sphere of the physician, that of drug preparation and dispensing to the sphere of the pharmacist. Physician and pharmacist are thus mutually dependent on each other, and a spirit of friendly and helpful co-operation must subsist between them for the attainment of the fullest measure of success in the direction of the end in view that both have in common—namely, the healing of the sick.

BOOK REVIEWS.

THE MICROSCOPY OF VEGETABLE FOODS with special reference to the detection of adulterations and the diagnosis of mixtures. By Andrew L. Winton, Connecticut Agricultural Experiment Station, and Josef Moeller, University of Graz. Large 8vo, xvi + 701 pages, 589 figures. Cloth, $7.50. New York: John Wiley & Sons. London: Chapman & Hall, Ltd.

Both Doctors Winton and Moeller are well known for their valuable researches in the study of food products. Dr. Winton is a former student of the eminent pharmacognosist, Professor Moeller. It is rather unique to find a student associated with his teacher, each contributing his part to a common work, and the whole appearing almost simultaneously in two languages. In the American edition it is Dr. Winton with the collaboration of Professor Moeller. In the German edition it is Professor Moeller with the collaboration of Dr.

Winton. It is a beautiful acknowledgment of their confidence in each other and we have seldom seen the work of two men that is so much alike, in both drawings and descriptions, as in this instance.

The work is divided into ten parts, as follows: (1) Equipment, methods and general principles; (2) grain, its products and impurities; (3) oil seeds and oil cakes; (4) legumes; (5) nuts; (6) fruit and fruit products; (7) vegetables; (8) alkaloidal products and their substitutes; (9) spices and condiments; (10) commercial starches. There is in addition a general bibliography, a useful glossary, and a good index.

The microscopical characteristics of not less than 300 different substances are considered. The illustrations number nearly 600 and are very well done. It is the most elaborate book of the kind which has thus far appeared in the English language and is to be recommended for its completeness and accuracy.

ELEMENTS OF APPLIED MICROSCOPY, a text-book for beginners. By Charles Edward Amory Winslow, Massachusetts Institute of Technology. 12mo, xii + 183 pages, 60 figures. Cloth, $1.50. New York: John Wiley & Sons. London: Chapman & Hall, Ltd.

This is an excellent little book, and while the author modestly states that "it contains very few original data and treats no single subject with completeness," it has required a large amount of work on his part to get the material together. The following subjects are discussed: I. Function and Parts of the Microscope. II. Manipulation of the Microscope. III. The Mounting and Preparation of Objects for the Microscope. IV. Micrometry, and the Camera Lucida. V. The Microscopy of the Common Starches. VI. Foods and Drugs and their Adulterants. VII. The Examination of Textile Fibres. VIII. The Microscopy of Paper. IX. The Microscope in Medicine and Sanitation. X. Forensic Microscopy. XI. Microchemistry. XII. Petrography and Metallography.

A course, such as is indicated in this book, would be found very useful to the analyst, and we wonder that work of this kind has not been made an essential part of the training of chemists.

METHODS OF ORGANIC ANALYSIS. By Henry C. Sherman, Columbia University. New York: The Macmillan Company, 66 Fifth Avenue. $1.75.

This is an excellent book treating of the quantitative analysis of

food materials and related substances. Methods for the determination of the following substances are given: Nitrogen; sulphur; phosphorus; alcohols; aldehydes; carbohydrates; acids; oils, fats and waxes; fatty oils; butter; soaps and lubricants; proteids and cereals; milk. Each of these subjects is treated with considerable detail in reference to both analytical methods and the interpretation of results. As a rule, foot-notes show the original sources of statements or methods included in the text, while general or additional references are given at the end of each chapter. The references have been carefully selected and place the reader in touch with the most important literature. In addition the book contains a large amount of valuable information in the form of tables, as on the analytical properties of typical oils, fats and waxes, etc.

GRUNDZUGE DER CHEMISCHEN PFLANZENUNTERSUCHUNG. Von L. Rosenthaler, University of Strassburg. Berlin: Verlag von Julius Springer. M. 2.40.

Rosenthaler's little book of 124 pages contains methods for the quantitative determination of the following plant substances: Alkaloids; glucosides; fats and fatty oils; waxes; lecithin; ethereal oils; resins; tannin; phlobaphene; organic acids; proteids; decomposition products of proteids; enzymes; toxalbumins; carbohydrates and related substances; inorganic substances, etc. There are numerous references to the literature and a good index. The book contains modern methods and will be found very useful to analysts.

QUIZ-COMPENDS.

ESSENTIALS OF MATERIA MEDICA AND THERAPEUTICS. By Henry Morris. Thoroughly revised by W. A. Bastedo. Philadelphia, New York and London: W. B. Saunders & Co.

A COMPEND OF MEDICAL CHEMISTRY, inorganic and organic, including urinary analysis. By Henry Leffmann. Fifth edition. Philadelphia: P. Blakiston's Son & Co.

A COMPEND OF MEDICAL LATIN, designed especially for elementary training of medical students. By W. T. St. Clair. Second edition. Philadelphia: P. Blakiston's Son & Co.

Saunders & Co. advertise in the book by Morris and Bastedo that "since the issue of the first volume of the Saunders Question-Compends, over 250,000 copies of these unrivalled publications have

been sold." Dr. Leffmann is probably the spokesman for the Blakiston compends, for he says in the preface: "It has been said that Alexander Pope is a poet whom everybody quotes and nobody reads. It may be said of compends that they are books that most professors and reviewers condemn and that nearly all students use." The book of St. Clair is more like a small text-book dealing with the application of the Latin language to medical terminology.

If the publishers and authors did not talk so much of the hundreds of thousands of these books that are sold, possibly the teachers and writers of text-books would not so seriously object to them. That these books have been so extensively used in certain quarters is probably in part due to the system of instruction in professional schools, for, as pointed out by Dr. Leffmann, the "students are obliged to meet two distinct requirements. They must study for the knowledge necessary for the practice of the profession and they must study to pass examinations. The latter are in so many cases arbitrary in scope, and affected by the personal equation of the examiner, that the student cannot be blamed for resorting to a concise presentation of the more important facts of the science, supplementing this by notes of the narrower and more strictly personal items of the teaching."

Students may purchase these books, but in the better schools the students do not use them so extensively as is supposed, and it is only a matter of time when the harvest in the sale of these books will be over. Quiz-compends are essentially publishers' books; men who esteem their reputations should not write them and students who wish to profit by their reading had better leave them alone. Books of quotations and concise facts prepared by others may sometimes be useful, but a scholar can never be made by using such books alone.

THE FRANKLIN BI-CENTENARY 1706–1906.

The two hundredth anniversary of the birth of Benjamin Franklin was celebrated in Philadelphia, April 17th to 20th, 1906. The celebration was under the auspices of the American Philosophical Society held at Philadelphia for Promoting Useful Knowledge. This society was founded by Franklin in 1743, and is the oldest scientific society in America. Prof. Edgar F. Smith, Vice-provost of the

University of Pennsylvania, is the president of the Society, and he, together with the other officers of the Society having the celebration in charge, deserves great credit for the admirable way in which the celebration was planned and carried out. In this connection Dr. I. Minis Hays, senior Secretary of the Society, deserves special mention, not only for having first conceived the idea of holding the celebration, but also because of the great amount of work which he did in arranging for it.

That the celebration was planned on broad lines is shown by the fact that no less than 125 of the oldest and leading learned societies and institutions of learning in all parts of the world were represented by delegates. The delegates numbered about 200 and included members of the Congress of the United States, members of the Legislature of the State of Pennsylvania and members of the Council of the City of Philadelphia. The meeting was therefore national in character, and some of the events connected with it served to make it international in significance and illustrated again the happy thought that the men of science and the men of letters constitute a world democracy. The special features of the programme were the conferring of the honorary degree of Doctor of Laws upon Miss Agnes Irwin, great-great-granddaughter of Franklin and dean of Radcliffe College, the Woman's Annex to Harvard University, by Mr. Andrew Carnegie, Lord Rector of St. Andrew's University, Scotland, who stated that this same degree had been conferred by St. Andrew's University on Benjamin Franklin in 1759; the presentation to the American Philosophical Society of two medallions —one of Benjamin Franklin made by his friend and admirer Josiah Wedgewood and one of Erasmus Darwin—by Sir George H. Darwin, great-grandson of Josiah Wedgewood and great-grandson of Erasmus Darwin; the conferring of the honorary degree of Doctor of Laws upon King Edward VII through the British Ambassador to the United States, Sir Henry Mortimer Durand, by the University of Pennsylvania; presentation of the Commemorative Medal to the Republic of France through His Excellency Jules Jusserand, LL.D., Ambassador Extraordinary and Envoy Plenipotentiary, by Hon. Elihu Root, LL.D., Secretary of State, under the direction of the President of the United States; and the exhibition of the Wilson portrait of Benjamin Franklin, which was stolen from his residence in Philadelphia during the Revolution, carried to England and

recently returned to this country from London by Earl Grey, Governor General of Canada, it having hung in Northumberland Castle, the ancestral home of the Greys, for 129 years.

In order to show yet more fully the character of the celebration, the programme is presented in condensed form as follows:—

OPENING SESSION, TUESDAY EVENING, APRIL 17th, AT WITHERSPOON HALL.

Address by the President.

Reception of Delegates from learned societies and institutions of learning.

Presentation of addresses by delegates.

THE UNIVERSITY OF ST. ANDREWS.

Conferring of the Honorary Degree of Doctor of Laws by the Lord Rector, Mr. Andrew Carnegie.

Informal reception after adjournment.

MEETING FOR THE READING OF PAPERS ON SUBJECTS OF SCIENCE, WEDNESDAY, APRIL 18TH, IN THE HALL OF THE SOCIETY.

The Statistical Method in Chemical Geology by Frank Wigglesworth Clarke, Sc.D., of Washington (illustrated by lantern slides).

On a possible Reversal of the Deep Sea Circulation and its Effect on Geological Climates by Prof. Thomas C. Chamberlin, of Chicago.

Elementary Species in Agriculture by Prof. Hugo deVries, of Amsterdam, Holland.

An International Southern Observatory by Prof. Edward C. Pickering, of Cambridge, Mass.

The Figure and Stability of a Liquid Satellite (with lantern slides of diagrams) by Sir George Howard Darwin, K.C.B., F.R.S., of Cambridge, England.

Form Analysis by Prof. Albert A. Michelson, of Chicago.

The Present Position of the Problem concerning the First Principles of Scientific Theory by Prof. Josiah Royce, of Cambridge, Mass.

The Human Harvest by President David Starr Jordan, of Stanford University, Cal.

On Positive and Negative Electrons by Prof. H. A. Lorentz, of Amsterdam.

The Elimination of Velocity-Head in the Measurements of Pressures in a Fluid Stream by Prof. Francis E. Nipher, of St. Louis.

Old Weather Records and Franklin as a Meteorologist by Prof. Cleveland Abbe, of Washington.

Was Lewis Evans or Benjamin Franklin the first to recognize that our Northeast Storms come from the Southwest? by Prof. William Morris Davis, of Cambridge, Mass.

Notes on the Production of Optical Planes of large Dimensions by Dr. John A. Brashear, of Allegheny, Pa.

A new Mountain Observatory by Prof. George E. Hale, Pasadena, Cal.

EVENING SESSION, WEDNESDAY, APRIL 18TH, AT WITHERSPOON HALL.

ADDRESSES.

Franklin's Researches in Electricity by Prof. Edward L. Nichols, Ph.D., of Ithaca.

The Modern Theories of Electricity and their Relation to the Franklinian Theory by Prof. Ernest Rutherford, F.R.S., of Montreal.

THURSDAY, APRIL 19TH, AT THE AMERICAN ACADEMY OF MUSIC, AT 11 A.M.

THE UNIVERSITY OF PENNSYLVANIA.

Conferring of honorary degrees.

Oration by the Hon. Hampton L. Carson, Attorney-General of the Commonwealth of Pennsylvania.

AT CHRIST CHURCH BURYING GROUND, 4 P.M.

Ceremonies at the Grave of Franklin, under the auspices of the Grand Lodge of F. & A. M., of Pennsylvania.

RECEPTION AT THE BELLEVUE-STRATFORD, 9 P.M.

FRIDAY, APRIL 20TH, AT THE AMERICAN ACADEMY OF MUSIC, 11 A.M.

ADDRESSES IN COMMEMORATION OF BENJAMIN FRANKLIN

As Citizen and Philanthropist by Horace Howard Furness, Litt. D. (Cantab.).

As Statesman and Diplomatist, by the Hon. Joseph Hodges Choate, LL.D., D.C.L.

As Printer and Philosopher, by President Charles William Eliot, LL.D.

PRESENTATION OF THE FRANKLIN MEDAL TO THE REPUBLIC OF FRANCE

(In accordance with the Act of Congress)
By the Honorable Elihu Root, Secretary of State
(By direction of the President)

MEETING FOR THE READING OF PAPERS ON SUBJECTS OF SCIENCE AT 3 P.M. IN THE HALL OF THE SOCIETY.

Repetition and Variation in Poetic Structure by Prof. Francis Barton Gummere, of Haverford, Pa.

The Herodotean Prototype of Esther and Sheherazade by Prof. Paul Haupt, of Baltimore, Md.

Heredity and Variation, Logical and Biological, by Prof. Wm. Keith Brooks, of Baltimore.

Notes on a Collection of Fossil Mammals from Natal by Prof. William B. Scott, of Princeton.

The Use of Dilute Solutions of Sulphuric Acid as a Fungicide by Prof. Henry Kraemer, of Philadelphia.

Franklin and the Germans by Prof. M.D. Learned, of Philadelphia.

The Use of High Explosive Projectiles by Prof. Charles E. Munroe, of Washington.

Ammoniacal Gas Liquors by Prof. Charles E. Munroe, of Washington.

The Chromosomes in the Spermatogenesis of the Hemiptera Heteroptera by Prof. Thomas H. Montgomery, Jr., of Austin, Texas.

DINNER AT THE BELLEVUE-STRATFORD, 7 P.M.

Toasts were responded to by Senator Lodge, Sir George Howard Darwin, Andrew Carnegie, His Excellency Jules Jusserand, Dr. S. Weir Mitchell, Hon. Elihu Root, and Governor Pennypacker.

In a number of instances the formal addresses sent by the institutions and societies invited to participate in the celebration were richly engrossed and illuminated, and while for the most part the English language was the medium of expression, some of them were in Latin, one in German, one in Dutch and one in Japanese.

The delegates appeared in their academic robes at the opening meeting on Tuesday evening and at the meeting on Friday morning, and this added much to the picturesqueness and splendor of these sessions. Interest in the commemorative session was also heightened by the fact that the Governor of Pennsylvania, as patron of the Society, presided.

It may not be amiss to state that those announced on the programme as presenting papers were present to read them in person with but few exceptions, one of these being President Jordan, of Leland Stanford University, who, in view of the destruction wrought by the recent earthquake in California, had selected for his paper the oddly significant title, "The Human Harvest."

Prof. Ernest Rutherford took his hearers to the outermost bounds of our knowledge of the material world, and said that in our attempt to explain matter we were more nearly in the position of explaining it away. He defined matter as electricity in motion, but said that science could give no adequate answer to the question, "What is electricity?" In commenting on the electrical theories of Franklin he said:

> The theory of electricity developed by Franklin, generally known as the 'one-fluid' theory, must be regarded as the greatest of his additions to electrical knowledge, for it has exerted a profound influence on the development of electrical ideas, and, even after the lapse of a century and a half of ceaseless activity in electrical research, still holds its place, though in a modified form, as the generally accepted explanation of the connection between positive and negative electricity.
>
> After a century and a half of great scientific activity, which has added enormously to our knowledge of electricity, the ideas of electricity which are in vogue to-day bear a remarkable resemblance to those advocated by Franklin in the infancy of the subject. This resemblance must have been obvious to you all in the light of the recent developments which have been touched upon in this paper. We believe that there is one kind of electricity, namely, negative electricity, which is carried in small definite units by the electrons. These electrons are a mobile constituent of all matter and are able to move freely through metals.

Altogether it may be said that those in attendance enjoyed a rare intellectual feast, and that the occasion, which witnessed the whole world paying homage to the memory of a man born two hundred years ago, furnished another proof of the saying that no good or great work ever dies.

FLORENCE YAPLE.

THE PHILADELPHIA BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The formal meeting for organizing the Philadelphia Branch of the American Pharmaceutical Association was held in the hall of the College of Physicians on the evening of Wednesday, March 28, 1906.

The committee that had been appointed at the preliminary meeting to prepare and to present a set of rules or by-laws for the guidance of the local branch made their report, and this report, after some discussion and a few minor amendments, was adopted as the—

PREAMBLE AND RULES FOR THE GUIDANCE OF THE PHILADELPHIA BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

WHEREAS, The advancement of pharmaceutical knowledge and the elevation of the professional character of apothecaries and druggists throughout the United States are objects that are dear to us, in common with all well-disposed pharmacists; and,

WHEREAS, Some of those in whose hands the practice of pharmacy now exists do not manifest the necessary professional spirit, or a proper appreciation for the duties and the responsibilities that are involved;

Therefore, We, the undersigned members of the American Pharmaceutical Association, do hereby resolve to constitute ourselves into a local branch, for the purpose of more actively pursuing and accomplishing the objects for which that association was founded.

The name of this society shall be, "The Philadelphia Branch of the American Pharmaceutical Association."

This branch hereby adopts for its guidance and declares its adherence to the Constitution and By-laws of the American Pharmaceutical Association, and the individual members hereby signify their willingness to live up to and to abide by the precepts and the provisions that are embodied in the constitution now in force.

The active members, in appending their names as members, further signify their willingness to subscribe to and to abide by the Code of Ethics promulgated by the Founders of the American Pharmaceutical Association.

BY-LAWS.

Members—This branch shall consist of active and of associate members.

All members of the American Pharmaceutical Association, in good standing, residing in the county of Philadelphia shall be accredited as being associate members of this branch.

All members of the American Pharmaceutical Association residing in, or within a radius of seventy-five miles of the city of Philadelphia, may, on signifying their intention of adhering strictly to the provisions enumerated in the preamble, and in the constitution of the American Pharmaceutical Association, be elected to active membership in this branch.

Officers—The officers of this branch shall be a president, two vice-presidents and a secretary-treasurer.

Executive Committee—The officers of this branch shall constitute an executive committee to transact all necessary business connected with the regular meetings of this branch.

Meetings—The meetings of this branch shall be held monthly, from October to May inclusive.

Quorum—Five members of this branch shall constitute a quorum.

Dues—Every active member of this branch shall annually contribute the sum of one dollar.

Elections—The officers shall be elected, by ballot, at the March meeting, and shall serve one year, or, until their successors shall have been elected.

Presiding Officer—In the absence of the president or vice-presidents at any stated meeting, the members present shall elect a presiding officer, *pro tempore.*

Order of Business—(1) Reading of the minutes of the last stated meeting; (2) Introduction of new members; (3) Nominations and elections; (4) Unfinished or referred business; (5) New business; (6) Scientific business. Adjournment.

Rules of Order—On all points not specifically mentioned in the rules governing this section, the by-laws of the American Pharmaceutical Association shall take precedence over other decisions or treatises on parliamentary rules.

The election of officers for the current year resulted in the selection of: Prof. Joseph P. Remington, president; William McIntyre, first vice-president; William L. Cliffe, second vice-president; M. I. Wilbert, secretary-treasurer.

Following the election of officers the chairman announced that several prominent medical men had honored the birth of this local section with their presence and suggested that some of them at least might be willing to express their opinions on the timeliness or the necessity of a movement of this kind.

In answer to this invitation, Dr. Solomon Solis Cohen, and Dr. Henry Beates, Jr., expressed their gratification at being able to be present at this the initial meeting of an association which they thought would prove to be an important factor in the advancement of scientific pharmacy and incidentally of the science of medicine.

Dr. Cohen welcomed the foundation of this local branch of the American Pharmaceutical Association, because, to him, it meant not alone the assurance of a more active pursuit of the science of pharmacy, on the part of the members of this local branch, but it also meant, to the medical practitioner, that the fact that a pharmacist is an active member of this local branch will be a guarantee of his trustworthiness and his integrity.

Dr. Henry Beates, Jr., the president of the Pennsylvania State Board of Medical Examiners, after congratulating the members present on the honor of having inaugurated this important step toward advancing the science of pharmacy, assured his hearers that with the improvements that are now being made, in the training given to future medical men, the coming medical practitioner will be more appreciative of true worth in the practice of pharmacy and that the time is not far distant when the conditions will warrant higher and better compensation for really capable pharmacists.

The meeting did not adjourn until a late hour and every one present appeared to feel that he had taken part in a meeting that would serve to mark the inauguration of a new era in the progress of pharmacy.

The second stated meeting of the Philadelphia Branch of the American Pharmaceutical Association was held on the evening of Tuesday, April 24th, in the hall of the College of Physicians, the subject for discussion being "The Immediate Object and the Aims of the Philadelphia Branch of American Pharmaceutical Association."

M. I. WILBERT, *Secretary.*

PHILADELPHIA COLLEGE OF PHARMACY.

MINUTES OF THE ANNUAL MEETING.

The annual meeting of the members of the Philadelphia College of Pharmacy was held March 26, 1906, in the Library, at 4 o'clock, the President, Howard B. French, presiding.

Twenty members were present.

The minutes of the quarterly meeting held December 26, 1905, were read and approved.

The minutes of the Board of Trustees for December 5, 1905, January 2, February 6 and 19, 1906, were read by the Registrar, J. S. Beetem, and approved.

The President read his annual report, from which are abstracted the following items:—

The repairs made to the buildings during the year 1904 were of such a permanent character that but few repairs have been necessary during the past year, and all the buildings are now in a fairly good condition.

The Committee on Property have added 34 new lockers—making 134 now in use—and it is desirable that during the coming summer additional lockers

should be provided. During the past year two new branches were added to the first year curriculum, Algebra and Pharmaceutical Latin, both compulsory. The third year Supplementary Course has proven very valuable to the students and greatly increases the efficiency of the class.

Eleven students have taken the special course in Bacteriology. Three students have taken a special course in Technical Microscopy. Seven students have taken special instruction in the Pharmaceutical Laboratory.

Thirty-one third year students, of whom fifteen are doing special thesis work, twenty-three second year students and one first year student are taking special instruction in the Chemical Laboratory.

Four of the students have died during the year. Eight members of the College have died during the year : Henry N. Rittenhouse, Henry Cramer, John Bley, Allen Shryock, Robert C. Brodie, Edward T. Dobbins, Joseph P. Bolton, M.D., Louis Koch.

Two members have resigned.

Three members were elected : Ambrose Hunsberger, Clarence L. Bouta and John J. Finney.

While the College has had no official notification, the newspapers report that the will of our late member, Edward T. Dobbins, provides a scholarship in the College.

Your College has continued to hold its foremost rank among educational institutions devoted to pharmaceutical learning. Its present standard of admission is sixteen Regent's counts, which make our graduates eligible for examination by any of the State Pharmacy Boards.

Examinations for admission are to be conducted by the State Department of Education. The examination of applicants has been placed in the hands of Dr. Edgar A. Singer, Associate Superintendent of Public Schools, City Hall, Philadelphia.

Your President again desires to commend your Alumni Association for its continued activity.

The Committee on Nominations reported nominees for officers, trustees and committees to be voted for at this meeting.

Prof. Sadtler, Chairman of the Publication Committee, reported as follows :—

The AMERICAN JOURNAL OF PHARMACY has been issued regularly during the past year and the financial statement presented is gratifying to the Committee. The number of subscribers is being maintained, and special efforts are being made at present to materially increase the number of subscribers. The best firms in the country are represented in the advertising columns. This is a time when it is peculiarly fitting to point to the class of advertising carried by the JOURNAL as journals are being brought to account and being judged by the character of their advertising matter. There is probably not a journal or magazine in the country that has so consistently and for so long maintained the integrity of its advertising columns. Donations of the JOURNAL and other publications were received from our fellow members Harry L. Stiles and Jacob S. Beetem.

Prof. Henry Kraemer, Editor of the AMERICAN JOURNAL OF PHARMACY, reported as follows:—

There are two features which have especially characterized the AMERICAN JOURNAL OF PHARMACY during the past year. These are the large amount of illustrative material and the number of biographical sketches. Special mention is made of the series of articles begun in the October number on "London Botanic Gardens," by P. É. F. Perrédès. This series of articles is a contribution from the Wellcome Research Laboratories established by Henry S. Wellcome, a graduate of this College. In addition to these papers by Mr Perrédès we have published quite a number of very valuable papers of practical, educational, and scientific interest, including a series of papers on the New Pharmacopœia. The quarterly review on recent advances in pharmacy and allied subjects, by Mr. M. I. Wilbert, continues to be of very great interest and importance.

Mr. William McIntyre reported for the Committee on Pharmaceutical Meetings as follows:—

The Pharmaceutical Meetings have been held regularly during the year. Among those who have contributed or read papers were Joseph L. Lemberger, M. I. Wilbert, J. B. Moore, Thomas S. Wiegand, Henry Kraemer, Allen Shryock, Charles H. LaWall, Clayton M. Thrush, C. P. Gabell, Henry Leffmann, Edwin Leigh Newcomb, E. F. Cook, Virgil Coblentz, H. W. Wiley, and H. C. Wood, Jr. The collections of the College have been added to as a result of the meetings.

Joseph W. England, Curator of the Museum, reported as follows:—

The Museum is in good condition and has received a number of accessions during the past year. The collections of official preparations in the Reading Room for reference by students have been entirely changed since September 1, 1905, and replaced by preparations of the present United States Pharmacopœia. Your Curator wishes to present to the College on behalf of the Smith, Kline & French Company one of the older types of tablet machines. This machine was made in 1892 by Rhoades & Sears of Philadelphia, and was used as the model upon which the patent was granted. The College has received, in the past, other apparatus of historical value, and your Curator has a promise of more. These are now kept in the fire-proof vaults of the College, but, in time, steps will have to be taken for their special care in the Museum or elsewhere.

Thomas S. Wiegand, Ph.M., Librarian, made the following report:—

During the past year there have been added to the Library two hundred and sixty-five volumes. One hundred and fifty of these were the gift of our fellow member William A. Bullock. Four volumes of *Science* from Professor Sadtler. Two volumes of *Popular Science Monthly*, two volumes of *Science*, and two volumes of the *Journal* of the Franklin Institute from Mr. Craig D. Ritchie. A copy of the last edition of "Remington's Pharmacy" from the author. In

exchange for the AMERICAN JOURNAL OF PHARMACY have been received seventy-four domestic and thirty-two foreign periodicals, besides numerous consular reports, proceedings of societies, etc. A large number of publications from the Departments at Washington, and a number from State departments in different parts of the country have also been received, and a number were obtained by purchase. As usual, the Library has been consulted by many of the students, and professional men not connected with the College.

The annual election of officers and trustees was then held. Messrs. William McIntyre and E. F. Cook were appointed tellers. Letters were read from Walter V. Smith and Henry C. Blair declining to accept the nomination to the Board of Trustees, because of pressure of business and other duties.

The nominations were ordered reopened, and Jacob M. Baer and Warren H. Poley were nominated for membership in the Board of Trustees. The election resulted as follows: President, Howard B. French; First Vice-President, Mahlon N. Kline; Second Vice-President, R. V. Mattison; Treasurer, James T. Shinn; Corresponding Secretary, A. W. Miller; Recording Secretary, C. A. Weidemann; Curator, Joseph W. England; Librarian, Thomas S. Wiegand; Editor, Henry Kraemer.

Trustees: Walter A. Rumsey, Jacob M. Baer, and Warren H. Poley. Publication Committee: Samuel P. Sadtler, Wallace Procter, Henry Kraemer, Joseph W. England, Joseph P. Remington, Martin I. Wilbert and Miss Florence Yaple. Committee on Pharmaceutical Meetings: Joseph P. Remington, C. B. Lowe, Henry Kraemer, William L. Cliffe and William McIntyre.

Mr. Kline reported the death of Mr. Frederick Aschenbach as having occurred this day. Mr. Aschenbach was not a member of the College, but it was deemed appropriate to note his death because of his many years' connection with the drug trade of Philadelphia.

Professor Kraemer, in noting the presentation of a tablet machine from the Smith, Kline & French Company, moved that the thanks of the College be tendered the donors for the valuable accession to the museum. Seconded, and so ordered.

A pleasant incident of this meeting was the announcement that this day was the anniversary of the birth of Professor Remington, when congratulations were tendered him and the hope expressed that he might be spared to us for many years.

The president appointed William McIntyre, M. N. Kline, C. B. Lowe, Charles H. LaWall and Joseph W. England as delegates to

the Pennsylvania Pharmaceutical Association meeting at Glen Summit, on June 26th, 27th and 28th.

ABSTRACTS FROM THE MINUTES OF THE BOARD OF TRUSTEES.

December 5, 1905.—Thirteen members were present. The Committee on Instruction reported that they were engaged on the subject of entrance examinations.

The Committee on Examinations recommended that a list of suitable books be prepared for the use of students in preparation for entrance examinations, and that the list be published in the next announcement. This list of books is to be suggested by the State Superintendent of Public Instruction.

A communication was read from Dr. C. P. Franklin, Assistant Medical Director of the Garretson Hospital, offering the use of the hospital to the students whenever so needed.

January 2, 1906.—Thirteen members were present. The Committee on Library reported numerous additions to the library by presentation, purchase, and exchange.

The chairman of the Board, in calling attention to the recent gifts, stated the necessity for better protection for our valuable books and suggested that arrangements be made for such protection. The suggestion met with approval and was referred to a joint committee consisting of the Committee on Property and Committee on Library.

Mr. Cliffe, on behalf of the State Board of Pharmacy, expressed their appreciation of the courtesies extended by the Board of Trustees in allowing them the use of rooms in the College in which to conduct their examinations.

February 6, 1906.—Fifteen members were present. It was voted that in future the Seal of the College be attached on Certificates of Proficiency in Chemistry. The Committee on Library reported a number of accessions to the library.

The Committee on Instruction reported very fully the requirements necessary for admission to the College, including list of books and studies. This report will be published in the forthcoming Announcement. Mr. Leedom, on behalf of the Philadelphia Association of Retail Druggists, expressed the thanks of the Association for courtesies extended by the Board of Trustees.

Special Meeting, February 19, 1906.—Eleven members were present. The chairman stated that the meeting was called to take action upon the death of Edward T. Dobbins, who, for the past six years was a member of the Board. Remarks were made by Messrs. French, Remington, Boring and others, relative to Mr. Dobbins' active life and his interest in the Philadelphia College of Pharmacy.

It was moved that the Board of Trustees attend the funeral services from his late residence, 1808 South Rittenhouse Square, on Tuesday, February 20th; also that appropriate resolutions be drawn by a committee of three, and a copy be sent to the family. This was agreed to, and the chairman appointed Messrs. Remington, French and Shoemaker.

CHARLES A. WEIDEMANN, M.D.,
Recording Secretary.

THE AMERICAN
JOURNAL OF PHARMACY

JUNE, 1906.

AMERICAN PHARMACOPŒIA.

THE PHARMACOPŒIA OF THE UNITED STATES OF AMERICA, EIGHTH DECENNIAL REVISION.

A Contribution from SCHIMMEL & Co., Leipzig.[1]

The new edition of the American Pharmacopœia has deservedly met with general approbation. There are everywhere evidences of a serious effort to make the widest possible use of the achievements of science; particularly is this the case in the directions for testing. This also applies especially to the essential oils, which are mostly described in detail in such manner that the American Pharmacopœia may in this respect be characterized to a certain extent as typical. This favorable opinion of the whole does not preclude that some statements made in the Pharmacopœia are not correct, and also that several directions for testing call for criticism. For the sake of expediency, we will first of all discuss the specific gravities required by the Pharmacopœia, in a connected form, and then deal with the oils themselves.

As already mentioned by us in our Report of October, 1905, p. 74, the new American Pharmacopœia does not indicate these specific gravities of the essential oils, as is usually done, at $\frac{15^\circ}{15^\circ}$, but at $\frac{25^\circ}{25^\circ}$. This rule has induced us to determine for all essential oils included in the Pharmacopœia, the differences existing between the specific gravities at $\frac{15^\circ}{15^\circ}$ and at $\frac{25^\circ}{25^\circ}$, so as to form an opinion whether

[1]Printed from advance sheets of the Semi-annual Report of Schimmel & Co., April-May, 1906.

and in how far the limits of value given in the Pharmacopœia agree with those obtained at 15°. We have here in several cases found more or less considerable differences. For the purpose of a better review, we have combined the results obtained in a tabulated form (p. 256). The limits of value given in the American Pharmacopœia, which do not agree with ours, are printed in italic type. These limits printed thus cannot and should not in our opinion be accepted as such, for they are inconsistent with the values fixed for 15°, and are consequently incorrect. Differences of 1 in the third decimal figure have been left out of account, as they lie within the limits of error. We would still mention that the differences between the specific gravities determined at $\frac{15^\circ}{15^\circ}$ and at $\frac{25^\circ}{25^\circ}$, as given by us, agree well on the whole with those ascertained previously by Schreiner and Downer,[1] and also that the average value of these differences is the same as that found by those authors, viz. 0·00064 per degree of temperature.

Of alcohols, the American Pharmacopœia recognizes a strong alcohol of 94·9 per cent. by volume (Alcohol), and a weak one of 48·9 per cent. by volume (Alcohol dilutum). In the following pages the former is designated simply as "alcohol."

ANISE OIL (*Oleum anisi*).—Colorless or faintly yellow; d_{25° 0·975 to 0·985;[2] α_{D25° -2°;[3] solidifying point not below + 15°; soluble in an equal volume alcohol and in 5 vol. 90 per cent. alcohol.

BENZALDEHYDE (*Benzaldehydum*).—Colorless liquid, strongly refractive, with at least 85 per cent. pure benzaldehyde;[4] d_{25° about 1·045; $\alpha_D \pm 0^\circ$; boiling point 179 to 180°; soluble in alcohol in every proportion; test for absence of chlorinated products.

BITTER ALMOND OIL (*Oleum amygdalæ amaræ*).—Colorless or yellow; content of benzaldehyde at least 85 per cent.;[5] content of hydro-

---

[1] Phar. Archives 4 (1901), 165. Report April, 1902, 80.

[2] The upper limit of value should be 0·988, as otherwise especially the oils richest in anethol, and consequently the most valuable anise oils, could not be used. Comp. also the table (p. 256).

[3] This should read: up to — 2°.

[4] According to the method of determination by means of neutral sodium sulphite indicated by the Pharmacopœia, we found it impossible to obtain even approximately satisfactory results; for this reason, we greatly doubt the usefulness of this method.

[5] Comp. note under benzaldehyde.

cyanic acid between 2 and 4 per cent.;[1] $d_{25°}$ 1·045 to 1·060;[2] $\alpha_D \pm 0°$;[3] boiling point about 180°; soluble in every proportion in alcohol, also in an equal volume 70 per cent. alcohol;[4] test for absence of chlorinated products.

CAJEPUT OIL (*Oleum cajuputi*).—Colorless or greenish, cineol-content at least 55 per cent. by volume;[5] $d_{25°}$ 0·915 to 925;[6] lævo-rotatory, $\alpha_{D25°}$ not above — 2°;[7] soluble in every proportion in alcohol, also in 1 part 80 per cent. alcohol.

CAMPHOR (*Camphora*).—White, transparent mass; $d_{25°}$ 0 990; α_D to the right; melting point 175°; boiling point 204°.

CARAWAY OIL (*Oleum cari*).—Colorless or pale yellow; $d_{25°}$ 0 905 to 0·915;[8] $\alpha_{D25°}$ + 70 to + 80°; soluble in an equal volume alcohol, and in 3 to 10 volumes 80 per cent. alcohol.

CASSIA OIL[9] (*Oleum cinnamomi*).—Yellowish or brownish; content of cinnamic aldehyde at least 75 per cent. by volume; $d_{25°}$ 1·045 to

---

[1] Such a content of hydrocyanic acid cannot always be guaranteed.

[2] The specific gravity given is for a temperature of 15°, but it should be taken into consideration that even in the case of absolutely normal oils, it often amounts to 1·070; for 25° the following figures apply: 1·038 to 1·063 (comp. table.

[3] Occasionally a feeble optical activity is also observed.

[4] Of 70 per cent. alcohol 1 to 2 volumes are required to dissolve the oil.

[5] The estimation of cineol is accomplished by means of phosphoric acid in the following manner: 10 c.c. oil are dissolved in 50 c.c. petroleum ether, and to the well cooled solution (freezing mixture) is gradually added, whilst stirring, concentrated phosphoric acid, until the white compound separating off acquires a yellowish (or reddish) shade. The crystalline mass is then filtered off with a suction pump, washed with petroleum ether, pressed to remove the last liquid portions, and decomposed with water. The cineol separated off is estimated volumetrically and the percentage calculated.

We have again convinced ourselves by estimations of mixtures of a known cineol-content, that this method does not always give reliable results. This applies specially to oils less rich in cineol; for example, in mixtures of 50 per cent., the content of cineol found was up to 8 per cent. too little, although we endeavored by different small improvements, to avoid sources of error as much as possible. For this reason, the cineol estimations can only lay claim to approximate accuracy.

[6] As lower limit of value, 0·913 is to be recommended (comp. table).

[7] With pure distillates, we have observed rotations up to — 2° 40′.

[8] The specific gravity given applies to a temperature of 15°: it should read: $d_{25°}$ 0·899 to 0·909 (comp. table).

[9] Only the rectified oil answers the requirements given.

1·055;[1] $a_{25°}$ between — 1° and + 1°; soluble in 2 volumes 70 per cent. alcohol.

	$d\frac{15°}{15°}$	$d\frac{25°}{25°}$	Difference.	Limits of value at $\frac{15°}{15°}$	Limits of value at $\frac{25°}{25°}$	American Pharmacopœia $\frac{25°}{25°}$
Anise Oil	0·9915	0·9855	0·0060	0·984—0·994	0·978—0·988	0·975—*0·985*
Benzaldehyde	1·0584	1·0515	0·0069	1·050—1·055	1·043—1·048	about 1·045
Bitter Almond Oil	1·0655	1·0587	0·0068	1·045—1·070	1·038—1·063	*1·045—1·060*
Cajeput Oil	0·9215	0·9151	0·0064	0·919—0·930	0·913—0·924	*0·915*—0·925
Caraway Oil	0·9080	0·9023	0·0057	0·905—0·915	0·899—0·909	*0·905*—0·915
Cassia Oil, rect.	1·0551	1·0489	0·0062	1·053—1·065	1·047—1·059	1·045—*1·055*
Chenopodium Oil	0·9769	0·9706	0·0063	?		0·965—0·985
Cinnamic aldehyde	1·0560	1·0504	0·0056	1·054—1·058	1·048—1·052	about *1·047*
Clove Oil	1·0487	1·0422	0·0065	1·040—1·060	1·033—1·053	*1·040*—1·060
Copaiba Oil	0·9056	0·9002	0·0054	0·900—0·920	0·895—0·015	0·895—*0·905*
Coriander Oil	0·8739	0·8672	0·0067	0·870—0·880	0·863—0·873	0·863—0·878
Cubeb Oil	0·9214	0·9159	0·0055	0·915—0·930	0·909—0·924	0·905—0·925
Erigeron Oil	0·8865	0·8803	0·0062	0·850—0·870	0·844—0·864	0·845—0·865
Eucalyptol	0·9294	0·9227	0·0067	0·928—0·930	0·921—0·923	*0·925*
Eucalyptus Oil	0·9146	0·9083	0·0063	0·910—0·930	0·904—0·924	0·905—0·925
Eugenol	1·0716	1·0650	0·0066	1·071—1·074	1·064—1·067	*1·072*—1·074
Fennel Oil	0·9715	0·9653	0·0062	0·965—0·977	0·959—0·971	0·953—0·973
Hedeoma Oil (Oil of Amer. Pennyroyal)	0·9331	0·9271	0·0060	0·925—0·940	0·919—0·924	0·920—0·935
Oil of Juniper berries	0·8655	0·8593	0·0062	0·860—0·885	0·854—0·879	*0·860*—0·880
Lavender Oil	0·8864	0·8797	0·0067	0·882—0·895	0·875—0·888	*0·880*—0·892
Lemon Oil	0·8585	0·8527	0·0058	0·857—0·861	0·851—0·855	0·851—0·855
Mustard Oil	1·0200	1·0120	0·0080	1·016—1·025	1·008—1·017	*1·013*—1·020
Nutmeg Oil	0·9037	0·8972	0·0065	0·870—0·930	0·864—0·924	0·862—*0·910*
Peppermint Oil	0·9060	0·9006	0·0054	0·900—0·920	0·895—0·915	0·894—0·914
Pimenta Oil	1·0440	1·0372	0·0068	1·025—1·055	1·018—1·048	*1·033*—1·048
Rose Oil*		0·8625			0·854—0·867	0·855—*0·865*
Rosemary Oil	0·9077	0·9011	0·0066	0·900—0·920	0·893—0·913	0·894—0·912
Safrol	1·1054	1·0985	0·0069	1·105—1·107	1·098—1·100	*1·105*—1·106
Sandalwood Oil	0·9782	0·9735	0·0047	0·975—0·985	0·970—0·980	0·965—*0·975*
Sassafras Oil	1·0807	1·0740	0·0067	1·070—1·082	1·063—1·075	*1·065*—1·075
Savin Oil	0·9208	0·9150	0·0058	0·910—0·930	0·904—0·924	0·903—0·923
Spearmint Oil	0·9352	0·9290	0·0062	0·920—0·940	0·914—0·934	0·914—0·934
Sweet Orange Oil	0·8509	0·8452	0·0057	0·849—0·853	0·843—0·847	0·842—0·846
Thyme Oil, white	0·9068	0·9007	0·0061	0·900—0·935	0·894—0·929	*0·900*—0·930
Turpentine Oil	0·8682	0·8616	0·0066	0·865—0·875	0·858—0·868	*0·860*—0·870
Turpentine Oil, rect.	0·8708	0·8643	0·0065	0·860—0·871	0·853—0·864	*0·860*—0·865
Wintergreen Oil:						
a. from *Betula lenta* L.	1·1870	1·1794	0·0076	1·180—1·188	1·172—1·180	1·172—1·180
b. from *Gaultheria procumbens* L.	1·1864	1·1788	0·0076	1·180—1·188	1·172—1·180	1·172—1·180
c. artificial	1·1896	1·1817	0·0079	1·185—1·190	1·177—1·182	*1·180*—1·185

* The limits of value given for rose oil were based upon those in force for $\frac{30°}{25°}$.

CHENOPODIUM OIL (*Oleum chenopodii*).—Colorless or yellow, $d_{25°}$ about 965 to 0·085;[2] lævorotatory, $a_{D25°}$ not above — 5°;[3] soluble in 5 volumes 70 per cent. alcohol.

[1] The upper limit of value given is slightly too low; it should be 1·059 (comp. table).

[2] The Pharmacopœia here quite correctly only requires approximate values, as oil of chenopodium is extremely variable owing to its content of a constituent which decomposes very readily; this also causes changes in the specific gravity.

[3] We have observed with good commercial oils, rotations up to — 6°.

CINNAMIC ALDEHYDE (*Cinnaldehydum*).—Colorless;[1] containing at least 95 per cent. pure cinnamic aldehyde; $d_{25°}$ about 1·047;[2] a_D ± 0°; boils about 250° with decomposition; solidifies in a freezing mixture and melts again at — 7·5°; soluble in every proportion in alcohol.

CLOVE OIL (*Oleum caryophylli*).—Colorless or pale yellow; eugenol-content at least 80 per cent. by volume; $d_{25°}$ 1·040 to 1·060;[3] soluble in an equal volume alcohol, and in about 2 volumes 70 per cent. alcohol.

COPAIBA OIL (*Oleum copaibæ*).—Colorless or pale yellow, $d_{25°}$ 0·895 to 0·905;[4] a_D to the left; soluble in 2 vol. alcohol.[5]

CORIANDER OIL (*Oleum coriandri*).—Colorless or faintly yellow; $d_{25°}$ 0·863 to 0·878; $a_{D25°}$ + 7 to + 14°; soluble in 3 volumes 70 per cent. alcohol; in 80 and 90 per cent. alcohol soluble in every proportion.

OIL OF CUBEBS (*Oleum cubebæ*).—Colorless, pale green, or yellow; $d_{25°}$ 0·905 to 0·925; $a_{D25°}$ — 25 to — 40°.

ERIGERON OIL (*Oleum erigerontis*).—Faintly yellow; $d_{25°}$ 0·845 to 0·865; $a_{D25°}$ about + 50°; soluble in an equal volume alcohol.

EUCALYPTOL.—Colorless; $d_{25°}$ 0·925;[6] a_D ± 0°; boiling point 176 to 177°; solidifies on cooling into needle-shaped crystals, which melt at — 1°;[7] soluble in every proportion in alcohol.

EUCALYPTUS OIL (*Oleum eucalypti*).—Colorless or faintly yellow;[8] cineol-content at least 50 per cent. by volume;[9] $d_{25°}$ 0·905 to 0·925;

---

[1] Cinnamic aldehyde is not colorless, but bright yellow.

[2] The statement of the specific gravity is not correct, it should read $d_{25°}$ 1·048 to 1·52 (comp. table).

[3] As oils with a eugenol-content down to 80 per cent. are admitted, the lower limit of the specific gravity should be reduced to 1·033 (comp. table).

[4] The specific gravity at 15° amounts to up to 0·918, as we have recently observed with one of our own distillates (comp. Report April, 1905, 25). The specific gravity mentioned corresponds to the value 0·915 at 25° (see table).

[5] On the strength of observations with authentic material we are in a position to state that 1 vol. copaiba oil requires 5 to 10 vol. 95 per cent. alcohol to form a solution. See Report, April, 1905, 25.

[6] The specific gravity at 25° is not 0·925, but fluctuates between 0·921 and 0·923 (comp. table).

[7] Solidification has to be started in case of need by rubbing a glass rod on the wall of the vessel.

[8] The oil has occasionally also a greenish shade.

[9] With regard to the cineol-estimation, compare what has been said under cajeput oil.

a_D 25° not above + 10° ; soluble in every proportion in alcohol and in 3 volumes 70 per cent. alcohol ; free from phellandrene.

EUGENOL.—Colorless or faintly yellow; $d_{25°}$ 1·072 to 1·074[1] ; a_D ± 0° ; boiling point 251 to 253° ; soluble in every proportion in alcohol, and in 2 parts 70 per cent. alcohol.

FENNEL OIL (*Oleum fœniculi*).—Colorless or faintly yellow; $d_{25°}$ 0·953 to 0·973 ; solidification point not below + 5° ;[2] soluble in an equal volume alcohol, likewise in 10 volumes or less 80 per cent. alcohol.

OIL OF HEDEOMA OR AMERICAN PENNYROYAL (*Oleum hedeomæ*).—Faintly yellow; $d_{25°}$ 0·925 to 0·935 ; a_D 25° from about + 18 to + 22° ; soluble in 2 and more vols. 70 per cent. alcohol.

OIL OF JUNIPER BERRIES (*Oleum juniperi*).—Colorless, faintly green or yellow; $d_{25°}$ 0·860 to 0 880 ;[3] soluble in 10 volumes 90 per cent. alcohol.[4]

LAVENDER OIL (*Oleum lavandulæ florum*).—Colorless or yellow ; $d_{25°}$ 0·880 to 0·892 ;[5] soluble in 3 vol. 70 per cent. alcohol.

LEMON OIL (*Oleum limonis*)—Faintly yellow, citral-content not less than 4 per cent. ;[6] $d_{25°}$ 0·851 to 0·855 ; $a_{D25°}$ not below +

---

[1] These figures apply to 15° ; at 25° the specific gravity lies between 1·064 and 1·067 (comp. table).

[2] Solidification must in case of need be introduced by inoculation with a small crystal of anethol. The lowest limit of the solidification point might suitably be + 4°, as in commercial products it is usually found between + 4 and + 6°.

[3] Oil of juniper berries is also frequently lighter ; a lowest limit of 0·854 would be more suitable (comp. table).

[4] The specification of solubility is mostly only answered by quite fresh distillates ; even when kept in a rational manner the solubility of oil of juniper berries diminishes rapidly.

[5] The lower limit of the specific gravity is not correct ; it should read : 0·875 (comp. table).

[6] The citral-determination is made by Sadtler's method (comp. Reports, April, 1904, 47, and October, 1904, 119) with this extension, that in addition to the actual test also a " blind " test without oil is made ; this is no doubt a decided step in advance as in this manner the end of the reaction can be observed or approximated somewhat better, but in the tests made by us we have again come to the conclusion that a really exact determination is not possible even in this manner, and for this reason we must continue, as before, to characterize the method as unreliable.

60°;[1] a_D of the first 10 per cent. of the distillate may only differ 2° from the angle of rotation of the oil.[2]

MENTHOL.—Colorless needle-shaped or prismatic crystals, melting point 43°; boiling point 212°; alcoholic solution neutral and lævorotatory.

MUSTARD OIL (*Oleum sinapis volatile*).—Colorless or faintly yellow; $d_{25°}$ 1·013 to 1·020;[3] boiling point 148 to 152°; lowest content of allyl isothiocyanate 92°;[4] soluble in every proportion in alcohol.

NUTMEG OIL (*Oleum myristicæ*).—Colorless or faintly yellow; $d_{25°}$ 0·862 to 0·910;[5] $a_{D25°}$ + 14 to + 28°;[6] soluble in an equal vol. alcohol, and in 3 vol. 90 per cent. alcohol. When 2 to 3 c.c. oil are evaporated, no crystallizing residue should remain behind.

PEPPERMINT OIL[7] (*Oleum menthæ piperitæ.*)—Colorless;[8] $d_{25°}$ 0·894 to 0914; $a_{D25°}$ — 25 to — 33°; ester (menthyl acetate) at least 8 per cent.;[9] total menthol (free and esterified) at least 50 per cent.; soluble in an equal vol. alcohol; the solution in 4 volumes 70 per cent. alcohol may at most show a feeble opalescence.

---

[1] The rotation of lemon oil varies considerably with the temperature; the one given above would correspond to a rotation of 60° 41′ at the usual observation temperature of 20°. As pure oils are frequently met with, with a rotation down to 58°, and as most oils rotate about 60°, the above requirement of the Pharmacopœia does not take the actual facts sufficiently into account.

[2] According to our experience, the difference in pure oils frequently amounts to up to 5°.

[3] The lower limit is given too high, and should be 1·008 (comp. table).

[4] With regard to the determination, comp. the April-May Report, p. 44.

[5] The upper limit is given too low and must be increased to 0·924 as otherwise just the oil from the best material is excluded from medicinal use. Comp. Report October, 1904, 65; see also table.

[6] We have observed in our own distillates from nutmeg of best quality, rotations down to + 7° 52′. Comp. Report October, 1904, 65.

[7] The requirements given for peppermint oil are partly contradictory, so that it is not clear whether the oil from the State of New York ("Wayne County Oil") or that from Michigan ("Western Oil") is to be the official oil. Whereas the rotation applies chiefly to the first-named oil (Michigan oil rotates between — 18 and — 29°), the requirements of solubility exclude the former, as the New York oil is not soluble in 70 per cent. alcohol. It is difficult to understand why both oils are not admitted.

[8] Peppermint is not always colorless, but sometimes yellowish or greenish yellow.

[9] The ester-content is frequently lower; we have observed in authentic oils down to 4 per cent.

PIMENTA OIL (*Oleum pimentæ*).—Colorless, yellow or reddish; eugenol-content at least 65 per cent. by volume; $d_{25°}$ 1·033 to 1·048;[1] soluble in every proportion in 90 per cent. alcohol and also in 2 vol. 70 per cent. alcohol.

ROSE OIL (*Oleum rosæ*).—Faintly yellow; $d_{25°}$ 0·855 to 0·865;[2] saponification number 10 to 17;[3] solidifying point between 18 and 22°.[4]

ROSEMARY OIL (*Oleum rosmarini*).—Colorless or faintly yellow; $d_{25°}$ 0.894 to 0·912; $\alpha_{D25°}$ not above + 15°; the first 10 per cent. of the distillate must also be dextrorotatory. Ester-content (calculated as bornyl acetate) at least 5 per cent.; total borneol at least 15 per cent.;[5] soluble in 0·5 and more vol. 90 per cent. alcohol, and also in 2 to 10 vol. 80 per cent. alcohol.

SAFROL (*Safrolum*).—Colorless or faintly yellow; $d_{25°}$ 1·105 to 1·106;[6] $\alpha_D \pm 0°$; boiling point about 233°; when cooled to — 20° or below, it solidifies into a crystalline mass which does not melt below + 11°; soluble in about an equal volume alcohol, and in about 30 volumes 70 per cent. alcohol.

SANDALWOOD OIL, EAST INDIAN (*Oleum santali*).—Faintly yellow; $d_{25°}$ 0·965 to 0·975;[7] $\alpha_{D25°}$ — 16 to — 20°; santalol-content not below 90 per cent.;[8] soluble in 5 vol. 70 per cent. alcohol.

SASSAFRAS OIL (*Oleum sassafras*).—Yellow or reddish yellow;

---

[1] The lower limit of value is given too high, and should be 1·018. Comp. table; see also German Report April, 1899, 39.

[2] The upper limit is given too low, and should be 0·867 (comp. table).

[3] We have observed in pure oils saponification numbers between 8·5 and 19.

[4] As upper limit for the solidifying point 23·5° might be recommended.

[5] These requirements cannot be upheld; we have observed in good oils an ester-content down to 1·2 per cent., and a total content of borneol down to about 10 per cent.

[6] The *data* of the specific gravity approximately correspond to those determined for 15°: 1·105 to 1·107; at 25° the specific gravity varies between 1·098 and 1·100 (comp. table).

[7] The upper limit of value is too low, it should be 0·980 (comp. table).

[8] It is to be regretted that the Pharmacopœia bases its calculation of santalol on the formula $C_{15}H_{26}O$. We have already repeatedly pointed out that according to recent investigations the formula $C_{15}H_{24}O$ is undoubtedly more correct. Comp. Report, October, 1900, 58, and the April-May Report, p. 59. The lowest content of 90 per cent. mentioned above, and based upon $C_{15}H_{26}O$, corresponds to a minimum of 89·2 per cent. calculated on $C_{15}H_{24}O$.

$d_{25°}$ 1·065 to 1·075;[1] $a_{D25°}$ not above + 4°; soluble in every proportion in 90 per cent. alcohol.[2]

SAVIN OIL (*Oleum sabinæ*).—Colorless or yellowish; $d_{25°}$ 0·903 to 0·923; $a_{D25°}$ + 40 + 60°; soluble in about 0·5 volumes and more 90 per cent. alcohol.

SPEARMINT OIL (*Oleum menthæ viridis*).—Colorless, yellow, or greenish yellow; $d_{25°}$ 0·914 to 0·934; $a_{D25°}$ — 35 to — 48°; with an equal volume 80 per cent. alcohol it forms a clear solution which becomes cloudy when further diluted.

SWEET ORANGE OIL (*Oleum aurantii corticis*).—Faintly yellow;[3] $d_{25°}$ 0·842 to 0·846; $a_{D25°}$ not below + 95°.[4]

THYME OIL (*Oleum thymi*).—Colorless;[5] $d_{25°}$ 0·900 to 0·930;[6] feeble lævorotation, $a_{D25°}$ not above — 3°;[7] phenol-content at least 20 per cent. by volume; soluble in 0.5 vol. alcohol and in 1 to 2 vol. 80 per cent. alcohol.

THYMOL.—Large colorless, transparent rhombic prisms; $d_{25°}$ 1·030; melting point 50 to 51°; the alcoholic solution is optically inactive.

TURPENTINE OIL (*Oleum terebinthinæ*)—Colorless; $d_{25°}$ 0·860 to 0·870;[8] on distillation, the bulk should pass over between 155 and 162°; soluble in 3 vol. alcohol.

TURPENTINE OIL, RECTIFIED (*Oleum terebinthinæ rectificatum*)—Colorless; $d_{25°}$ 0·860 to 0·865.[9]

---

[1] For the lower limit of value, 1·063 is more suitable (comp. table).

[2] Not every oil answers this requirement. We have again recently found in one of our own distillates, that 1 to 2 vol. 90 per cent. alcohol are required to dissolve 1 vol. sassafras oil; this observation agrees with those repeatedly made with good commercial oils. Comp. also the April-May Report, p. 61.

[3] The color of orange oil is yellow to yellow-brown.

[4] Calculated for 20°, the rotation is + 96°; we have observed as lowest value at 20° + 95° 30′.

[5] The rectified oils also frequently acquire again the red-brown color of the crude oil.

[6] 0·900 is too high as lowest limit of value, and this should be 0·894 (comp. table).

[7] We have also repeatedly observed oils with a feeble dextrorotation; further, the rotation is sometimes a little higher than indicated in the Pharmacopœia. In most cases, the optical behavior of the oil can only be determined approximately on account of the dark color.

[8] It would be more correct to fix 0·858 as the lowest limit of value (comp. table).

[9] The lower limit applies to a temperature of 15°; for 25° it is 0·853 (comp. table).

VANILLIN.—Fine, white, crystalline needles; soluble in about 100 parts water of 25°, and in 15 parts of 80°; readily soluble in alcohol; melting point 80 to 81°.

WINTERGREEN OIL:

a. FROM BETULA LENTA L. (*Oleum betulæ*).—$a_D \pm 0°$; for the rest, the same properties as *Oleum gaultheriæ*.

b. FROM GAULTHERIA PROCUMBENS L. (*Oleum gaultheriæ*).—Colorless or almost colorless;[1] $d_{25°}$ 1·172 to 1·180; feeble lævorotation, $a_{D25°}$ up to $-1°$; boiling point 218 to 221°.

c. ARTIFICIAL WINTERGREEN OIL (*Methylis salicylas*).—Colorless; $d_{25°}$ 1·180 to 1·185;[2] $a_D \pm 0°$; boiling point 219 to 221°; soluble in every proportion in alcohol.

ASSAY OF OPIUM AND ITS PREPARATIONS.[3]

By PHILIP ASHER, PH.G., M.D.

A reliable and rapid method for the assay of opium and its preparations has long been a desideratum. In reviewing methods in vogue the one that appears most plausible, rational, easily-understood and practically under the full control of the operator, is the English method, as recently modified by Stevens. This method, however, has not given the results that had been expected of it, and in the Proceedings of the A. Ph. A., 1904, L. F. Kebler, Chief of the Drug Laboratory, U. S. Department of Agriculture, compiled results of various workers, which showed a lesser percentage than that obtained from other methods. In the outlines of the American Association of Agricultural Chemists, work for drugs for 1905, this subject is again taken up and a review of the methods suggested therein shows they do not contain the several new features embodied in this paper.

The process, as now again modified, has been found in the hands of the author to give results within a few milligrammes, of the quantity of morphine originally taken. Due credit must be given to Prof. A. B. Stevens, University of Michigan, and the principal point of my

---

[1] The oils are frequently of a reddish color, owing to traces of iron.

[2] The lower limit is given too high; it should be 1·177 (comp. table).

[3] Read before the Alumni Association of the New Orleans College of Pharmacy.

labor was to ascertain where the error lay and to correct the same, if possible.

The full modified process will first be given. (The portions in italics are the additions.) After which, such points will be dilated upon as may prove of interest, as well as giving reasons for the changes.

Place 4 grammes of dried or powdered opium in a 100 c.c. tared porcelain evaporating dish, "*add 5 c c. of KOH solution, 5 per cent. or its equivalent of a stronger solution, mix thoroughly with a rubber-tipped glass rod and evaporate on water-bath or drying closet, until of constant weight,*" then add 2 grammes of dry, freshly-slaked lime and 10 c.c. of water and triturate continually for fifteen minutes until a perfectly smooth mixture results. Finally, add 19 c.c. of water, triturating frequently during half an hour and filter through a dry filter about 10 centimeters in diameter. Transfer exactly 15 c.c. to a 100 c.c. Erlenmeyer flask and add to this 4 c.c. of alcohol and 10 c.c. of concentrated ether and shake the mixture. Then add ·500 gramme ammonium chloride. Shake well and frequently during half an hour. Set aside in a cool place for twelve hours.

Remove the stopper carefully and preserve with any adhering crystals, for future use. Pour the ethereal layer into a small funnel, the neck of which has been previously closed with a piece of absorbent cotton. Rinse the flask with 10 c.c. of ether, shake continually for five minutes and pour as before into the funnel, and when this has passed through, pour the contents of the flask into the funnel. *Add 5 c.c. of ether to the flask, rotate gently and pour into funnel, repeating with 5 c.c. more of ether.* Without trying to remove all the crystals from the bottle, wash the flask and contents of the funnel with saturated solution of morphine, small portions at a time, *using 15 c.c. in all.* When the crystals have drained, place the funnel in the bottle containing adhering crystals, and with a small rod drawn out to a curved point, lift the cotton and rinse the crystals into the bottle with 12 c.c. of decinormal sulphuric acid, using the cotton on the end of the rod to detach any adhering crystals. Place the cotton carefully into the flask, replace the stopper and agitate until the crystals are all dissolved. Rinse the cork and funnel with water, titrate the excess of acid with fortieth normal potassium hydroxide solution, using hæmatoxylin as an indicator.

Divide the number of cubic centimeters of potassium hydroxide

solution used by 4 and subtract the product from the 12 c.c. of acid used; the remainder will be the amount of acid consumed by the morphine, which number must be multiplied by ·030092, in turn dividing the last product by 2, which will give the per cent. of morphine obtained, but to which should be added ·070 as the corrective factor of the loss of morphine during estimation.

The above calculation can be materially lessened by multiplying the number of cubic centimeters of $\frac{n}{10}$ acid consumed by the morphine by 1·5046 and adding ·070 to the product.

ASSAY OF THE TINCTURE OF OPIUM.

"Add 5 c.c. of 5 per cent. KOH solution" to 40 c.c. of the tincture contained in a tared evaporating dish and evaporate about 8 grammes, add 2 grammes of freshly slaked dry lime and triturate to uniform mixture. Transfer to a graduated cylinder, rinsing capsule with water, using the tipped rod to facilitate same, until 30 c.c. are obtained. Drop upon the surface of the liquid 5 to 10 drops of ether, to destroy foam and air bubbles. Add water to exactly 31 c.c., close the cylinder with stopper and shake frequently during half an hour, filter, and from 15 c.c. of filtrate proceed as under opium, multiplying the number of cubic centimeters of acid consumed by ·15046 plus 70 and the product will be the number of grammes of morphine in 100 c.c. of tincture.

THE USE OF KOH SOLUTION.

The first assay carried out after the Stevens method was with the tincture and after the addition of the lime the odor of ammonia was very marked in some cases. The principle upon which this method depends is the fact that morphine is soluble in solution of calcium hydroxide and is precipitated by the ammonia produced by the action of the alkaline solution upon ammonium chloride. The presence then in the opium or tincture of ammonium compound will naturally precipitate the morphine before filtration and thus lessen the final result. Warming either opium or the tincture with KOH decomposes the ammonium compound and, as evidenced by experiment, the morphine content was greater in those cases made with the previous addition of KOH than in those made without it. It was further proven by adding to solution of morphine of known

strength small amounts of ammonium chloride and carrying out the assay with or without the addition of KOH, that in every case where the KOH solution was used, it gave a larger yield, corresponding closely to the amount of morphine originally used.

The amount of ammonium compounds present varies with each lot of opium and after a number of trials 5 c.c. has been shown to be ample.

In reference to the solution of morphine of known strength used, above referred to, I would add that a definite amount of morphine was dissolved in sufficient hydrochloric acid and to simulate as near as possible a tincture of opium, F. E. gentian and alcohol were added to it. While, of course, the other constituents of opium were lacking it gave a preparation containing at least some of the features of the tincture.

COTTON OR PAPER?

Experiments were conducted with a view to ascertain if paper possessed any advantage over cotton in retarding the passage of the small morphine crystals. Results have shown that there is practically nothing gained in the use of paper; in fact, in one or two instances, the apparent yield was in excess of the quantity used, due to the inability to thoroughly wash the paper. If care is observed in placing the cotton, it will retain all the crystals.

The better plan is to place the cotton in the funnel loosely and only force the lower portion into the neck of the funnel, leaving the balance fluffy. If the whole pledget is forced into the neck tightly, the flow will be retarded to such an extent as to vitiate the results, through the evaporation of the ether containing the narcotine.

WASHING WITH ETHER.

Stevens makes no provision for the complete removal of narcotine, which also remains behind if in any way the passage of the liquid is retarded. Experiments carried out along these lines disclose that the apparent yield of morphine is greater in the process without subsequent washing with ether than when it is used. As morphine is so slightly soluble in ether, and as only a slight rotation is directed, the solubility of the morphine in the ether used is practically nil and the function it serves is to remove the solution of narcotine by pushing it out, as it were.

WASH LIQUOR.

Experiments were conducted with saturated solutions of morphine alkaloid, hydrochloride and sulphate, to learn if they played any particular role in the final results. Solutions of the hydrochloride and sulphate offered no advantage and the morphinated water used by Stevens proved most desirable, owing to the slight solubility of morphine in water.

The 15 c.c. of liquid directed to be used after various trials, under different conditions, was found to be ample, and when lesser quantities were used the results were higher, owing to the non-removal of the alkali.

INDICATOR.

Hæmatoxylin has proven very successful in the writer's hands as the indicator in alkaloidal work. The use of the official hæmatoxylin solution has been very disappointing, not only in this, but in other methods where its use was indicated. Apparently, upon standing in contact with alcohol, a change takes place, preventing sharp end reactions. The method used was to boil distilled water in a test-tube and add to it a small crystal of hæmatoxylin and boil again for a minute. A few drops of this solution is used in each assay, and this gives an end reaction that is sharp and that will turn with less than one drop of $\frac{n}{40}$ solution.

COEFFICIENT.

The use of the coefficient or ·112 given by Stevens has been found too high and the factor .070 is nearer the difference between results obtained and the amount of substance originally taken. A review of the solubility of morphine in alcohol, water and ether, at a temperature of 25° C., compared to the amount of each used, gives one a still lower factor.

ADVANTAGES.

In comparing this process with others, it will be seen it possesses some great advantages. From the economical standpoint but 40 per cent. of the amount directed by the Pharmacopœia is required. Twenty c.c. has also been used with equally gratifying results, and no doubt even lesser amounts would show up as well. The use of small quantities with some degree of accuracy is desirable, especially to the analyst.

The ease of its application, as well as its rapidity, is much to be desired and when compared with the official method, is much to be preferred. But one evaporation and filtration is necessary and the whole work is actually performed in less than two hours. But one step in the whole method is to be deprecated, and that is from the strictly scientific point of view—the use of aliquot parts.

Unfortunately, the nature of the substance with which we are dealing offers no method wherein the use of the aliquot part and an alkali could be avoided. Endeavoring, however, to overcome this objection, the use of KOH was substituted for the calcium hydroxide and while the results were within the radius of accuracy, the resultant morphine was highly colored, which prevented its titration in the usual way, and the process, at best, was altogether too tedious and possessed no advantage over others.

Determinations were made with powdered opium, using the U. S. Pharmacopœia, Stevens and the modified method of the author, and while the results were in favor of the U. S. Pharmacopœia method, if the correction factor was used it turned the balance in favor of the last method, and as the U. S. Pharmacopœia method does not take into consideration the possible loss by solution, it is safe to assume that this method would give equal results.

Before concluding, I would call attention to one point, which is of prime importance from the legal point of view: Assuming that these methods give concordant results, can we legally apply them in preference to the official? The Pharmacopœia, in its definition of the various kinds of opium, or its preparations, uses this expression: "When assayed by the process given under *Opium*." Would it be a mere case of technicality, or would the law view it in a broader light, if some other were used?

SYRUP OF WILD CHERRY, U. S. P. 1900.

By Joseph W. England.

Under the title of Prunus Virginiana, Wild Cherry Bark was first made official in the U. S. Pharmacopœia of 1840, as was also the infusion of the bark. Syrup of Wild Cherry was not recognized until the following revision (1850), and the formula adopted was based upon that of W. Procter, Jr., and J. C. Turnpenny, read at the

Pharmaceutical Meeting of the Philadelphia College of Pharmacy held February 14, 1842 (*American Journal of Pharmacy*, 1843. 27).

Procter and Turnpenny's formula consisted, briefly, in macerating and percolating, under proper conditions, 5 troy ounces of coarsely ground bark with sufficient water to measure one pint, and dissolving, by agitation, 24 troy ounces of sugar in the percolate.

In the U.S.P. of 1860 and of 1870, the same formula was followed as in 1850, with the exception that the sugar was increased to 28 troy ounces. (For the purpose of comparison, the formulas hereinafter stated are given in the usual weights and measures, and not in the official system.)

In the U.S.P. of 1880, the powdered bark (5½ avoirdupois ounces) was macerated and percolated with sufficient water to make 15 fluidounces of percolate, to which was added 28 avoirdupois ounces of sugar and 2 fluidounces of glycerin.

In the U.S.P. of 1890, further changes were made. The powdered bark (reduced in quantity to 5 avoirdupois ounces) was macerated and percolated with 4¾ fluidounces of glycerin and sufficient water to make the percolate measure, practically, 14 (exactly 13·8) fluidounces, after which the sugar (reduced in quantity to 23¼ avoirdupois ounces) was dissolved by agitation, and sufficient water added to make the finished product measure 2 pints. This process yielded a beautiful ruby-red syrup that was slightly astringent in taste, and was permanent. The use of glycerin for the purpose of preventing fermentation in the drug during the process of percolation, was first proposed by C. Schnabel (1874), a purpose it admirably serves, especially during the summer season.

In the present U.S.P. (1900) formula, the quantities of ingredients remain practically the same, but in procedure two radical changes have been made: No glycerin is used in the menstruum, and the quantity of aqueous percolate has been reduced to practically 9½ (exactly 9·6) fluidounces, instead of the 14, 15 or 16 fluidounces formerly directed.

It is obvious, if only two-thirds of the former quantity of menstruum is used, that the finished product will be considerably weaker in content of active ingredients, assuming that the larger quantity of menstruum exhausts a larger quantity of the bark; and that such is the case, is proven by the fact that the quantity of bark specified in the formula is decidedly in excess of the quantity required to

saturate the aqueous menstruum, being more than three times as much as that used in the official infusion of wild cherry (293 grains to the pint).

The aqueous percolate (which is really a cold aqueous infusion) employed in making the syrup, is a saturated solution of the water-soluble principles of wild cherry bark; and since the present U. S. P. syrup represents only a little more than 25 per cent. of aqueous percolate, and the syrups formerly official represented about 50 per cent., the marked decrease in strength can be readily seen. In addition, the reduction in strength of the formula is contrary to the experience of the framers of the previous five decennial revisions of the U. S. Pharmacopœia.

Further, the absence of glycerin in the percolating liquid is a distinct loss, as a preventive of possible fermentation in the drug during percolation. The addition of glycerin to the aqueous percolate, as directed by the present official formula, is of no service, save to give "body," and for this purpose additional sugar could have been used, and the quantity of aqueous percolate proportionately increased, with resulting advantage to the finished product.

The 1900 syrup is of an amber color and insipid taste; the 1890 syrup is of a deep ruby-red color; and while more astringent in taste, it is much more characteristic of the bark, and its astringency, especially when diluted with water, as on administration, is practically nil. The average dose of the 1900 syrup is officially stated to be one fluidrachm. This is entirely too small; the general quantity given is from 2 to 4 fluidrachms or one-half fluidounce.

Commercially, five wild cherry barks are known, as follows: The green skin, the thin, the extra thin, the thick, and the choke. The official barks have a maximum thickness of 4 mm. or 1/6 of an inch.

Syrups were made three months ago from each of these five barks, by the U. S. P. 1890 process and by the U. S. P. 1900 process, and are here shown. The syrups exhibited radical differences in physical properties, according to the process used; and in the judgment of the writer, the formula of the present U. S. Pharmacopœia is distinctly inferior to those formerly official. He would recommend the use of the formula of 1890 slightly modified, as follows:—

Wild Cherry, in No. 20 powder, 5 oz. av. (150 gm.)

Sugar, granulated, 24 oz. av. (720 gm.)

Glycerin, 4 fl. oz. (125 c.c.)

Water, a sufficient quantity to make 2 pints (1000 c.c).

Mix the glycerin with 10 fluidounces of water (300 c.c.). Moisten the wild cherry with a sufficient quantity of the liquid, and macerate for twenty-four hours in a covered vessel; then pack it firmly in a cylindrical percolator, and pour on the remainder of the menstruum. When the liquid has disappeared from the surface, follow it by water until the percolate measures 15 fluidounces (450 c.c.). Dissolve the sugar in the percolate by agitation, without heat, strain, and pour enough water through the strainer to make the product measure 2 pints (1000 c.c.). Mix thoroughly.

LONDON BOTANIC GARDENS.

By Pierre Élie Félix Perrédès, B.Sc., F.L.S.,
Pharmaceutical Chemist.

A Contribution from the Wellcome Research Laboratories, London.

(*Continued from p. 236.*)

THE WORK ACCOMPLISHED IN THE GARDEN, DURING THE ADMINISTRATION OF THE SOCIETY OF APOTHECARIES.

In the introductory chapter a summary was given of the botanical work accomplished by the Apothecaries in their garden at Chelsea, and from this we have seen that it was mainly of an educational character. The various systems of classification, for example, from that of Ray downwards, were reflected in the arrangement of the plants in the garden, and this practical application of one system or the other was preceded, as a rule, by its adoption in the lectures and demonstrations, and foreshadowed in many notable contributions to scientific literature by prominent apothecaries or by members of the garden staff. These important matters will be considered in greater detail presently, but it will be expedient, in the first place, to trace the steps by which the collections of plants were developed.

One of the earliest references to the contents of the Garden is to the effect that in 1678 a good crop of herbs for the use of the Laboratory was furnished from the garden, and it is also on record that directions were given, in the same year, to have the garden planted with the best varieties of fruit trees. In the autumn of

1682 "Dr. Herman, of Leyden, visited Chelsea Garden, and proposed an exchange of plants, which proposal Mr. Watts went to Holland to carry into effect." The system of exchange thus inaugurated became the most important factor in developing the collections at the Chelsea Garden, and from Pulteney's "Sketches" we learn that during Philip Miller's curatorship "it was the remark of foreigners, that *Chelsea* exhibited the treasures of both the *Indies*." These acquisitions of rare plants are mentioned by the Garden Committee in 1750, and credit is given to Philip Miller for his "great diligence in settling a correspondence, and procuring seeds and plants from various parts of the world." In 1771 and 1772 "a great interchange of exotic plants took place between the Society" and a number of "Noblemen, Gentlemen and others." "Her R. H. the Princess Dowager's garden at Kew" is mentioned among the contributors, and we also learn that "a bag of seeds was presented by Joseph Banks, Esq., and Dr. Solander." The influence of Philip Miller is here clearly perceptible, as Aiton who had charge of the Princess Augusta's garden at Kew was, as we have already seen, a former pupil of his, while Banks is also said to have received his early training in botany at Miller's hands. The policy so zealously pursued by Philip Miller was vigorously maintained by the Society after his death, and we accordingly find that the Demonstrator of Plants was, by the rules of 1773, "earnestly recommended" to "cultivate an extensive botanical correspondence both at home and abroad." It is evident that this recommendation bore fruit, for extensive accessions of plants and seeds from various parts of the world are recorded in 1778, 1781, 1790, 1793, and 1809. In 1815 the Court of Assistants determined "to advance" the garden "to as high a rank in the scale of exotic gardening as the . . . improved state of that science would require," and with the cooperation of William Anderson, the new gardener, steps were taken to bring about the desired result. During Lindley's tenure of office as Professor of Botany and *Præfectus Horti* the collections were doubtless maintained at a high level of excellence, although it must be confessed that details are wanting on this point. The appointment of Robert Fortune as curator in 1846 was attended with fruitful results, and the mention of his name brings us to a subject of cardinal importance in the history of the cultivation of exotic plants. Fortune, before his appointment as Curator at the Chelsea Garden,

had held the post of Botanical Collector to the Horticultural Society of London. In that capacity he had just returned to England from China, and during his three years' exploration of the latter country he had enriched the Horticultural Society's gardens at Chiswick with a large number of valuable plants. "Wardian Cases" were used by Fortune for transporting to England the living plants which he had collected in China, and to this application of Ward's discovery the great success of Fortune's mission was largely due.

Some of the services which Nathaniel Bagshaw Ward, F.R.S., rendered to the Society of Apothecaries have already been mentioned in the preceding pages. We have seen, for instance, that he held the post of Examiner for Prizes in Botany from 1836 to 1854, and that he was the prime mover in the renewal of activities at the Chelsea Garden in 1863. But Ward's scientific and administrative work was not limited to this, for he was one of the founders of the Royal Microscopical Society, established in 1840, and in 1854 he became Master of the Society of Apothecaries. During his year of office as Master he gave "on a very large scale" at the Apothecaries' Hall "two microscopical *soirées*, which have never been surpassed either there or elsewhere." His name, moreover, will always be associated with the discovery of the fact that plants which would otherwise perish in a smoky atmosphere, such as that of London, could be made to thrive if placed in "closely-glazed cases." This discovery was first made known to the world in a letter to Sir William Hooker which appeared in the "Companion to the Botanical Magazine" for May, 1836, and details of the cases and their various applications were published in 1842 in a little work of 95 pages entitled "On the Growth of Plants in Closely Glazed Cases: by N. B. Ward, F.L.S." The fourth chapter of the work "on the conveyance of plants and seeds on ship-board" is the one of most interest to us, as Ward here gives an account of several experiments in which the transport of living plants had been successfully accomplished by the use of the cases he had invented. The first of these shipments was made "in the beginning of June, 1833," when two cases filled with "ferns, grasses, etc.," were sent to Sydney, N.S.W., in the charge of Capt. Charles Mallard, R. N., with the following result:—

"SYDNEY, January 18, 1834.

"*Sir:*—I have the happiness to inform you that the plants contained in the wo glazed cases entrusted to my care, were landed here at the Botanical Gar-

den about three weeks ago, nearly the whole of them alive and flourishing. They have since been transplanted by Mr. McLean, who has charge of the garden in the absence of Mr. Cunningham (gone to New Zealand botanizing), and all are doing well.

"The complete success of your interesting experiment has been decidedly proved; and whilst offering you my congratulations upon this agreeable result, I cannot but feel some little degree of pride and pleasure in having been the instrument selected to put to the proof so important a discovery to the botanical world.

"I am, Sir, etc., etc.,

"CHARLES MALLARD."

"*To N. B. Ward, Esq.*"

It was Fortune, however, who first demonstrated on a large scale the value of the Wardian case in transporting living plants, and the revolution which this means of transport brought about is made evident in the following passage:—

"Eighteen glazed cases filled with the most beautiful plants of northern China were placed upon the poop of the ship, and we sailed [from Canton] on the 22d of December [1845]. After a long but favourable voyage, we anchored in the Thames, on the 6th of May, 1846. The plants arrived in excellent order, and were immediately conveyed to the garden of the Horticultural Society at Chiswick."[1]

As a contrast to this we have it on record that in 1819 only one plant in a thousand had survived a similar voyage under the old conditions.

In 1848 Fortune resigned the post of Curator of the Chelsea Physic Garden to enter the employ of the East India Company. His success in introducing the tea-plant into India for the Company is a matter of common knowledge, as is also Markham's feat with cinchona; and both of these achievements were only made possible by the application of Ward's discovery.[2]

After Ward's death, in 1868, the work o the garden languished owing to insufficient funds, and although Thomas Moore, the Cura-

---

[1] "Three years' Wanderings in the Northern Provinces of China, including a visit to the Tea, Silk, and Cotton Countries: with an account of the Agriculture and Horticulture of the Chinese, New Plants, etc., by Robert Fortune, Botanical Collector to the Horticultural Society of London." London, 1847, p. 405.

[2] For a description of the cases used by Markham see his "Peruvian Bark. A popular account of the Introduction of Chinchona cultivation into British India," London, 1880, pp. 259–265, where a short comparison is also made with those that Fortune employed.

tor, did his best and appealed to correpondents at home and abroad for donations of plants, his efforts were only partly successful. The temporary improvement effected through the exertions of Nathaniel Bagshaw Ward thus suffered a gradual decline, which ultimately resulted in the practical extinction of activities at the Chelsea Garden.

The system of sending out collectors of plants never seems to have been adopted by the Society of Apothecaries, owing probably to the expense which it entailed, but there is an entry in 1732 to the effect that "£20 per annum be paid by the Society towards the expense of sending a person to Georgia, to collect trees and plants, and to make experiments concerning raising them in England, which sum was in the following year ordered to be paid to the trustees for that colony." Now that botanic gardens have been established in all parts of the world, the system of exchange inaugurated in 1682 at the Chelsea Garden has almost entirely superseded that of sending out plant collectors, and all botanic gardens of importance issue periodically lists of seeds or of plants for exchange.

Turning now to the matters which have been referred to in the opening paragraph of this section, we shall find much to interest us; for the history of botany, and especially that of Systematic Botany, in this country, is mirrored in that of the Chelsea Physic Garden.

Systematic Botany in England may be said to have originated with John Ray (if we except Robert Morison), and the system which he elaborated in his *Historia Plantarum* marks an era in the history of botanical science.[1] Ray acknowledges as his collaborators Samuel Doody, who was associated with the early history of the Chelsea

---

[1] It does not fall within the limits of this paper to enter into details of the different systems of classification, but the reader will find an admirable account of the latter in Asa Gray's "Structural Botany" or Part I of "The Botanical Text Book (Sixth Edition)." New York and Chicago, 1880, pp. 331–344. This is a little masterpiece of conciseness and precision, as lucid as it is exact; but the student who is desirous of pursuing the subject further should consult the spirited but subjective account in the "History of Botany (1530–1860), by Julius von Sachs . . Authorized translation by Henry E. F. Garnsey, M.A., revised by Isaac Bayley Balfour, M.A., M.D., F.R.S." Oxford, 1890, pp. 3—216.

Engler's system has not been adopted, to my knowledge, in any of our Botanic Gardens, so that the two above-mentioned works contain all that is necessary for our purpose. A comparison of Engler's system with that of Bentham and Hooker will be found in J. C. Willis's "Manual and Dictionary of the Flowering Plants and Ferns." Cambridge, 1897, Vol. I, pp. 133–147.

Garden, and James Petiver, the Society's first Demonstrator of Plants. It is hence reasonable to infer that his system was reflected in the arrangement of the plants in the garden and in Petiver's demonstrations, but it must be admitted that this is largely a matter of conjecture. Suffice it to say, however, that Petiver was himself a contributor to the third volume of the *Historia Plantarum*, and that he adapted his writings to that work. We find, moreover, that Samuel Dale, the learned apothecary of Braintree, adopted Ray's system in his standard work, the *Pharmacologia*. But the influence of Ray's contemporary, Tournefort, was also making itself felt, and this is perhaps indicated by the fact that Philip Miller followed a neutral course in his catalogue, published in 1730, of the officinal plants in the Garden.[1] In this small book of 152 pages the plants are divided into two sections, viz., (1) Herbs and Undershrubs; (2) Trees and Shrubs. Each section is arranged alphabetically, but copious references are given to the works of Tournefort and Ray, as well as to those of other botanists. Another catalogue covering the same ground was published in the same year by Isaac Rand, the Demonstrator of Plants.[2] The author of this

[1] *Catalogus Plantarum officinalium quae in Horto Chelseiano aluntur.* London, 1730. This contains the names of 499 plants—405 in the first section (*Herbæ et Suffrutices*) and 94 in the second (*Arbores et Frutices*). It is written in Latin, but an English name is also given to each plant.

[2] *Index Plantarum Officinalium, quas, ad Materiæ Medicæ Scientiam Promovendam, in Horto Chelseiano, Ali ac Demonstrari curavit Societas Pharmaceutica Londinensis.* London, 1730. This catalogue is little more than a duplication of Miller's work, but it contains the names of 518 plants as against Miller's 499, "and specifies the part of each used in medicine." The appearance of these two catalogues in the same year is thus explained by Martyn, in the preface to his edition of Miller's Dictionary: "Mr. Rand, then Lecturer and Demonstrator to the Company of Apothecaries in their Botanic Garden, regarded this book of Mr. Miller's as an incroachment upon his province: he therefore published in the same year, *Index Plantarum Officinalium Horti Chelseiani.*" Henry Field in his "Memoirs" omits all reference to Philip Miller's *Catalogus*, but refers to Rand's *Index* in the following terms: "1729. Mr. Isaac Rand laid before the Court of Assistants his 'Index Officinalis Horti Chelseiani;' when one thousand copies were ordered to be printed at the expense of the Society. This was a catalogue of that part of the garden which was allotted to the culture of medicinal plants, shrubs and trees, contained in the Pharmacopœia of the College of Physicians; and was designed for the use of those Apprentices, who attended the Botanical Lectures at the garden." *Per contra*, Semple, in his revision of Field's work, mentions Philip Miller's *Catalogus*, but suppresses Field's reference to Rand's *Index*. This omission is probably

work does not even go to the length of dividing his list into two sections, but he adopts the alphabetical arrangement throughout, and this non-committal attitude was also assumed in 1722 by Joseph Miller in his *Botanicum Officinale*, by Rand in his second Index (1739), and by Philip Miller in his Dictionary (from 1724 until 1759). The influence of both Ray and Tournefort is, however, clearly perceptible in these earlier editions of Philip Miller's Dictionary, that of Tournefort predominating. The old print of the garden published in 1753, and reproduced on Plate XXV,[1] throws a considerable amount of light on the disposition of the plants in the garden at that date. The arborescent plants are located together in two plots ("The Wilderness where many kinds of Trees grow"), there is a "place where the Physical Plants are placed alphabetically," the "Bulbous Rooted Flowers" have a section to themselves, the "Annual and Biennial Plants" occupy another section, and the "Perennial Plants" complete the list. Except in the case of the medicinal plants there is no indication given of the way in which these various groups are classified, but it is interesting to note that the division into arborescent and herbaceous plants is common to the systems of Ray and Tournefort, and that the "Bulbous Rooted Flowers" probably correspond to those of the twenty-first book of Ray's *Historia Plantarum*, "*qui est De Herbis radice bulbosa donatis iisque affinibus*." The section devoted to medicinal plants also suggests several points of interest. We find, in the first place, that this collection, which was by far the largest one at the beginning of the eighteenth century, now forms but a relatively small part of the varied contents of the garden, and we also perceive that the alphabetical arrangement which had commended

---

due to a confusion of the *Index* with a later catalogue by Rand entitled *Horti Medici Chelseiani Index Compendiarius* [etc.], and published in 1739; for the author (Semple), in his description of the *latter* work, states that "it would appear from some pages in the biography of Mr. Philip Miller, that Mr. Rand prepared this Index in consequence of his feeling hurt at the publication of the Catalogue of the contents of the Garden by the former, who, as Mr. Rand considered, had encroached upon his province, he being the Præfectus Horti and Botanical Demonstrator while Mr. Miller was the Gardener." The confusion has doubtless arisen from the fact that the original "Memoirs" by Henry Field are silent on the subject of Rand's *second* catalogue.

[1] I am indebted to Mr. H. Howard Batten, the clerk to the Trustees of the Chelsea Physic Garden, for the loan of the block from which this plate was printed.

itself to the demonstrators, Isaac Rand and Joseph Miller, in their writings, has been applied to the living plants themselves.

In 1736 Linné visited the garden, and cordial relations were established between the illustrious Swedish botanist and the *personnel* of the Chelsea Physic Garden. These relations were maintained through the medium of correspondence during succeeding years, with the result that the Linnean or "sexual" system found among the members of the Chelsea Garden staff some of its earliest exponents in this country. William Hudson, an active member of the Garden Committee, who subsequently held the post of Demonstrator of Plants and *Præfectus Horti* from 1765 to 1771, was one of the earliest Linnean botanists in England, and he is even stated to have been the first author in this country who embraced the Linnean system. This statement, however, is perhaps not quite accurate, and it must not be forgotten that Benjamin Stillingfleet and James Lee, not to mention Philip Miller, had preceded Hudson in the *publication* of Linnean literature. In this connection the following estimate by Pulteney [1] is probably not far from the truth :

"By all these preliminary advances,[2] the learned were prepared to see the *English* botany modelled according to the rules of the *Linnæan* school. Dr. HILL seized the first opportunity of attempting it, in his *Flora Britannica*, 1760 ; but it was executed in a manner so unworthy of his abili ies that his work can have no claim to the merit of having answered the occasion : and thus the credit of the atchievement fell to the lot of Mr. William HUDSON, F.R.S., who, to an extensive knowledge of *English* plants, acquired by an attention to nature, had, by his residence in the *British Museum*, all the auxiliary resources that could favor his design : access particularly to the Herbaria of almost all the assistants of RAY and DILLENIUS,[3] mentioned in the *Synopsis*,[4] gave him the opportunity of comparing the individual specimens of

---

[1] *Loc. cit.*, Vol. II, pp. 351-352.

[2] The "preliminary advances" mentioned by Pulteney comprise: (1) References to the writings of Linné in Martyn's *Virgil* (1740), in Dillenius's *Historia Muscorum* (1741), in Blackstone's *Specimen Botanicum* (1746), and in the "Philosophical Transactions ;" (2) the arrangement of "all the plants of RAY's *Synopsis*, according to the system of his master," by "a *Swedish* pupil of the *Upsal* school" (1754) ; (3) Browne's adoption of the Linnean system for classifying "his *Jamaica* plants" (1756) ; (4) Stillingfleet's "Translations of several tracts from the *Amœnitates*" (1759), and Lee's "Translation of the *Elements* of the Sexual System" (1760) ; and (5) Solander's arrival "into England on the 1st of July, 1760."

[3] Dillenius was the first Sherardian Professor of Botany at Oxford.

[4] The first edition of Ray's *Synopsis Stirpium Britannicarum* was published in 1690. The third edition, by Dillenius, was issued in 1724.

that work with his own; and thus enabled him to dispel a multitude of doubts and uncertainties, in which, otherwise, his application of the *synonyma* might have been involved."

Even the venerable Philip Miller became converted to the Linnean doctrine, and the process of conversion is made apparent in the edition of 1759 of his dictionary, where the system of Linné is given a place. Miller, however, was at first reluctant to abandon the systems of Ray and Tournefort, to which he had been accustomed throughout his working life, but he was ultimately weaned from them completely, and we find him publishing, in his seventieth year, a "Short Introduction to the Knowledge of the Science of Botany, Explaining the Terms of Art Made Use of in the Linnæan System" (London, 1760). In the eighth edition of his dictionary (London, 1768), which was the last published in his lifetime, the Linnean system only was recognized, but the alphabetical arrangement was still preserved. Once adopted, the "sexual" system of Linné swept all before it, and for a period of sixty years the Chelsea Physic Garden became one of its impregnable strongholds. William Curtis, the author of the *Flora Londinensis* and of the "Botanical Magazine," who was Demonstrator of Plants from 1773 to 1777, was one of its most able exponents, as evidenced by his educational works: "Linnæus's System of Botany, so far as relates to his Classes and Orders of Plants" (London, 1777), which was "drawn up for the use of his pupils," and "Lectures on Botany as delivered in the Botanic Garden at Lambeth," published posthumously in 1805. Thomas Wheeler, his successor, was a staunch adherent of Linné to the last and a fierce antagonist of the "natural" system promulgated by Jussieu in 1789. During his term of office the whole of the collections were arranged according to the "sexual" system, but the medicinal plants were still kept apart from the general collection.

The first attempt to introduce the natural system into the garden was made in 1821, when the Demonstrator was requested to employ some time at each demonstration "in explaining to the Students the systems of Botany, both Sexual and Natural, as taught by Linnæus and Jussieu." When the scope of the lectures in the garden was extended in 1830, it was again specified that "the different systems of Botany, both natural and artificial, particularly those of Linnæus and Jussieu," should form a part of the course. The *Catalogus Rationalis Plantarum Medicinalium, in horto Societatis Pharmaceuticæ*

Londinensis, apud vicum Chelsea, cultarum, published by James Lowe Wheeler in 1830, affords evidence that these instructions were carried into effect. The author in that work adopted the system of Linné in the main text, but this was supplemented by a *Synopsis Plantarum Medicinalium, secundum Systema, D. Jussieu, dispositarum*, and the class and order of Jussieu's *Genera Plantarum*, as well as Linné's *Ordo Naturalis*, were, moreover, mentioned under each genus in the portion classified according to the "sexual" system. The arrangement of the plants in the garden, however, seems to have undergone no change until the advent of Lindley, for Anderson, the gardener, was stubbornly attached to the Linnean creed, and refused to adopt any other. But when Lindley came upon the scene Anderson was forced to give way, and Lindley's system was gradually introduced. It is, nevertheless, interesting to note that Lindley himself realized that his system left much to be desired, and he ultimately almost abandoned it in his lectures. He saw clearly that all attempts to arrange a natural system in a consecutive series of natural orders must result in a series of compromises, and he therefore preferred to deal with the orders in natural groups which he termed *Nixus* or Tendencies, and Cohorts or Alliances. This attitude is curiously reflected in his *Flora Medica*, published in 1838. In the preface to that work he says: "In the present state of systematical Botany no two writers upon classification can agree respecting the exact sequence in which the natural orders of plants should follow each other. By some the plan of Jussieu is adopted, by others that of De Candolle, and by many the systems of Endlicher, of the author of this work, of Von Martius, of Schultz, or even of Reichenbach, may be preferred. This can only be accounted for upon the supposition that the systems of all these authors are equally false." As a result, and in order "to enable the reader of this book to suit his own convenience in the arrangement of the matter, the work is so printed that the different natural orders may be cut asunder and re-arranged at the pleasure of the possessor."

The rearrangement of the plants in the garden was considerably delayed owing to the persistent hostility of Anderson to Lindley's wishes, but the Professor of Botany was equally insistent on having these complied with, so that pressure was brought to bear on Anderson with the result that a new arrangement of the medicinal plants was, so far as possible, completed in 1839, and, in 1847, the

entire collections were rearranged by Fortune under Lindley's direction. The system of Decandolle was subsequently applied to a part of the collections, but we have no precise information as to when this took place. From the description given of the garden by Semple in 1878 we learn that both Decandolle's and Lindley's systems were at that date represented in the plantations of medicinal plants, the older and less important plantation being that arranged according to the system of Lindley. The portion to the south of the centre path which crosses the garden from the students' entrance in Swan Walk to the opposite side was occupied, as at present, by beds of hardy herbaceous plants, and the plants in this section of the garden were arranged in Decandollean orders, but the latter were not placed in sequence. Near the centre of the garden there was a span-roofed house divided into "stove" and greenhouse, and devoted to medicinal plants. No alteration in these arrangements appears to have been made until the garden changed hands, and Mr. Hales, the present Curator, informs me that, when he took over the collections, these, although much deteriorated, were substantially the same as in 1878.

[*To be continued.*]

PROGRESS IN PHARMACY.

A QUARTERLY REVIEW OF SOME OF THE MORE INTERESTING LITERATURE RELATING TO PHARMACY.

By M. I. Wilbert,
Apothecary at the German Hospital, Philadelphia, Pa.

The earthquake and the succeeding conflagration that virtually destroyed the city of San Francisco on April 18, 1906, has been for weeks the one topic that is foremost in the minds of men in all parts of the civilized world.

Among the numerous thousands of the citizens of San Francisco who have been rendered homeless and practically penniless, there are no less than 200 pharmacists and upwards of 800 physicians.

While liberal donations from all sections of the United States have provided for the immediate needs of the homeless, so far as food and temporary shelter are concerned, many, if not all, of the pharmacists and physicians will be practically compelled to begin

life anew, and to live under conditions that are far from promising or encouraging.

Recognizing the coming needs of the retail pharmacists of San Francisco, the Executive Committee of the National Association of Retail Druggists has shown commendable energy in making preparations to raise a fund of $100,000 or more, to assist these destitute fellow-members of our craft to renew business at an early date.

The American Medical Association has instituted a similar fund for relieving the physicians of San Francisco and the surrounding towns who have been made destitute, and it is but reasonable to expect that every fair-minded pharmacist will contribute what he can, at a very early date, to either the one or the other, or perhaps both, of these funds.

Patent and Proprietary Medicines continue to have difficulty in maintaining their prestige.

While it is true that practically all of the so-called "formula on the label bills" have been disposed of in a manner agreeable to the members of the Proprietary Association of America, it is also true that the feeling that something should be done to compel publicity in connection with fakes and frauds, is constantly growing, and that it will be but a matter of time when full and complete formulas will be considered necessary in connection with all proprietary medicines.

New Dutch Pharmacopœia.—The fourth edition of the "Nederlandsche Pharmacopee" has been published and becomes official from the 1st of July, 1906.

The book is published both in the Dutch and Latin languages and is the official text for Holland as well as all of the Dutch Colonies.

The appendix contains several novel innovations, one of them, a chapter on first aid to the injured, and another a dissertation on the antidotes for the more common poisons. In common with the Austrian and other European Pharmacopœias, the atomic weight table is based on $O = 16$.

The formulas recommended by the International Conference for the unification of the formulæ of potent medicaments have been generally adopted and are designated throughout the book by the addition of F. I., evidently intended to designate them as "Formula Internationalis."

The Pharmacopœia contains 652 official medicaments, of which

210 are designated as being essential and must therefore be found in all of the apothecary shops.

The tests that are included are numerous and varied; they include among others the determination of the melting point, boiling point and congealing point of many substances, the iodine and the saponification numbers of fatty oils, extensive tests for ethereal oils, and the microscopic examination of powdered drugs.

In the matter of making preparations it is interesting to note that aromatic waters are to be made by distillation. Aqueous extracts are to be prepared by maceration or infusion and alcoholic extracts by percolation. (*Phar. Zeitg.*, 1906.)

The French Military Pharmacists.—The French Army now has 115 military pharmacists, consisting of 1 inspector, 4 principals of the first class, 5 principals of the second class, 30 majors of the first class, 45 majors of the second class, 20 aide majors of the first class, 10 aide majors of the second class. These rank respectively as second lieutenant, first lieutenant, captain, major, lieutenant-colonel, colonel, and major-general.

Up to and including pharmacist-major of the first class, advancement is primarily by length of service plus merit, while for the higher grade selection by merit is given the preference. (*Apothek. Zeitg.*, 1906, 217.)

Aromatic Waters.—In a recent number of the *Pharmaceutical Journal* (1906, page 344), W. S. Glass repeats a suggestion he had previously made to make the official aromatic waters by dissolving the respective oils by agitation with hot distilled water, in the proportion of 2 c.c. to 1000 c.c. of distilled water, and filtering, when cold, through a double well-wetted filtering paper.

For rose and neroli half the quantity of the oil is said to secure a saturated solution.

Detection of Small Traces of Copper in Distilled Water.—Add 1 or 2 drops of ammonia to 500 c.c. of the suspected water and filter it three or four times through a plug of cotton wool. A faint green color of the cotton wool indicates the presence of copper in quantities too small to be detected by sulphuretted hydrogen or potassium ferrocyanide. (*Phar. Jour.*, 1906, p. 387, from *Apoth. Zeitg.*)

Non-combustible Celluloid.—According to a recently issued English patent the addition of boric acid to celluloid, in process of manufacture, will materially reduce the danger from fire. The description

of a mixture of this kind embodied in the patent application consists of 4 parts nitrocellulose, 2 parts camphor and 3 parts boric acid. (*Chem. Zeitg.*, 1906, page 178.)

Atomic Weights.—The International Commission for the determination of corrections in the atomic weights of elements, has adopted the following modifications based on the standard of O = 16, the only one now recognized by the Commission.

Antimony, Sb	120·2
Calcium, Ca	40·1
Iron, Fe	55·9
Iodine, I	126·97
Mercury, Hg	200·00
Tin, Sn	119·00

(*Phar. Zeitg.*, 1906, page 191.)

Toxic Symptoms following Use of B-Eucain.—J. Kraus reports that almost immediately after the injection of 10 c.c. of a 2 per cent. solution of B-Eucain into the urethra the patient experienced a high degree of irritability, dyspnea, cramp-like contractions, paralysis of speech, etc., that continued for upwards of one and a half hours. Faradization and inhalation of oxygen improved the condition gradually. (*Phar. Zeitg.*, 1906, page 192, from *Deut. Med. Woch.-Schr.*)

Poisoning by Stovain.—Trautenroth reports that after the injection of 0·06 gramme of stovain, which produced the desired analgesia, the patient manifested dyspnea and choking, which gradually disappeared. Several days later the patient complained of severe headache and a marked inflammation of the terminal nerves of the scalp. These symptoms disappeared more slowly. (*Phar. Zeitg.*, 1906, page 192, from *D. Med. Wochschr.*)

Benzosalin.—Methylester of Benzoyl salicylic acid to be used in place of the now popular acetyl-salicylic acid. Benzosalin is insoluble in water but soluble in alcohol or ether; melts at 82° C., and is practically tasteless. Said to be useful in rheumatism, neuralgia, etc. Dose, 1 gramme four times a day. (*Zeitschr. D. A. öst. Apothek. Ver.*, 1906, page 110.)

Flutol is described as Fluorbrom phenyl-bismuth, which is said to be useful as an antiseptic. (*Phar. Zeitg.*, 1906, page 192.)

Gaultherine is said to be Sodium-methyl salicylate, it is only slightly soluble in water but freely soluble in alcohol. It has been

suggested as an efficient antiseptic and antiferment. Dose, 0·3 to 0·6 gramme. (*Phar. Centh.*, 1906, page 240.)

Jasmiflorin.—A crystallizable glucoside prepared by Vintelesco from the green twigs of Jasminum indiflorum. It is levogyrate and decomposed by emulsin and also by boiling with dilute mineral acid. (*Jour. Phar. et de Chem.*, 1906, page 305.)

Kolatine.—An alkaloid from fresh kola nut, is said to be quite distinct from the kolamine of Knebel. Kolatine occurs as prismatic needles, melts at 150° C., is fairly soluble in water, more readily soluble in alcohol, acetone and ether, but almost insoluble in chloroform. The pharmacologic investigation of kolatine is now being carried out. (*Phar. Jour.*, 1906, page 261, from *Bull. Com.*)

Salene is an oily liquid consisting of a mixture of methyl and ethyl glycol salicylates. It is employed as an external application diluted with alcohol or with castor oil, in painful rheumatic affections.

Salene is only sparingly soluble in olive oil but is more readily soluble in castor oil or in alcohol, and is directed to be diluted with equal parts of castor oil or of alcohol for external use.

Taxicatin.—Lefebre has isolated a crystallizable glucoside from the fresh leaves of Taxus baccata which he calls Taxicatin. Taxicatin melts at 165° C., is levogyrate, and is decomposed by emulsin. Fuming nitric acid produces with this glucoside a blue color, differing from Picrin and Congerin which do not show this reaction. (*Jour. de Phar. et de Chem.*, 1906, page 304.)

Thiobromose or *Thiobrominlithium* is theobromin in which one atom of hydrogen has been replaced by one atom of lithium.

It occurs as fine silky needle-shaped crystals that are freely soluble in water; the solution, however, is unstable and, on long standing, the solution is gradually decomposed into lithium carbonate and theobromin. (*Phar. Centh.*, 1906, page 304.)

Vesipyrin.—Acetyl-salicylic-acid-phenyl ether or acetyl-salol is a crystalline substance that is insoluble in water but readily soluble in alcohol. It is said to be produced by the direct combination of molecular quantities of its constituents.

Said to be useful in cases of articular rheumatism, influenza, inflammation of the kidneys and cystitis, etc.

Vesipyrin may be given in doses of 1 gramme three or four times a day. (*Phar. Centh.*, 1906, page 130.)

THE PROCTER MEMORIAL.

If any one should feel doubtful about the success of the Procter Monument let him be assured that the idea of the monument did not spring up in a day, but that it is the result of discussion and thought, and that it is already firmly fixed in the minds of a large number of American pharmacists. As stated by Professor Hallberg in the May number of the *Bulletin of the American Pharmaceutical Association*, the monument is an assured fact.

It now remains to set about collecting the funds in a systematic manner, and in order that this part of the work may not drag over too long a period, it is urged that every pharmaceutical organization in the country, including the State pharmaceutical associations, the colleges and schools of pharmacy, local pharmaceutical associations, the National Association of Wholesale Druggists and the National Association of Retail Druggists, appoint committees for collecting funds from their respective members. It is hoped that by such concerted action the Committee on Procter Monument will be able to make a report at the meeting of the American Pharmaceutical Association at Indianapolis in September, which will reflect credit not only on the organizations named, but which will likewise stand to the credit of the individual members of the pharmaceutical calling in America.

The following circular letter has been issued by the Committee:—

TO THE PHARMACISTS AND DRUGGISTS OF AMERICA AND WHOMSOEVER ELSE THIS MAY INTEREST.

Greeting:—At the annual meeting of the American Pharmaceutical Association in 1899—after the reading of the report of the Committee on the Semi-Centennial Celebration, Albert E. Ebert, of Chicago, made the following remarks: "If that committee is to be continued, I would like to draw their attention to one feature. One of the founders of this Association, and the father of American Pharmacy, William Procter, Jr., is seemingly forgotten. It seems to me, without saying anything against the other men who have lived and worked for the advancement of pharmacy and this association, that it is possible for this association at the time of our fiftieth anniversary to do something to commemorate his valuable work; it would be a grand thing for the association. There has been no

man associated with this organization who has done so much, who has been such a faithful servant of this association in times gone by, who cared for it to the extent that William Procter did; I hope when we meet in Philadelphia in 1902, that something will be done to commemorate the grand work William Procter, Jr., has done for this association and American pharmacy."

At the next meeting held at Richmond, Va., in 1900, Prof. Joseph P. Remington read an interesting memorial address on the life of William Procter, Jr. This was published in the proceedings of that year.

Since that time the reminiscences of personal friends and various recommendations of pharmacists, teachers, and editors, have been published in pages of the AMERICAN JOURNAL OF PHARMACY, and other pharmaceutical periodicals.

In 1901 President John F. Patton in his address to the American Pharmaceutical Association, referred to the remarks of Mr. Ebert, made at the meeting in 1899; and subsequently his successor, President H. M. Whelpley, appointed a committee on the William Procter, Jr., fund. This committee made a report at the semi-centennial meeting in Philadelphia in 1902, in which they recommended that the life membership fund be changed to the William Procter, Jr., fund. Other recommendations were made, and a resolution was passed to hold the fund in reserve until it shall have reached $25,000. After this report, John F. Hancock made some remarks recommending the erection of a monument at the National Capital, as a memorial to Professor Procter; and at the Jubilee session A. E. Ebert read a memorial sketch of the late Professor Procter.

At the 1903 meeting of the American Pharmaceutical Association the William Procter, Jr., Fund Committee made a report in favor of not using any of the fund until $25,000 shall have been collected. At this meeting John F. Hancock presented a paper advocating a memorial monument, and at the meeting in 1904 Mr. Hancock presented another paper in favor of this monument and offered the following preambles and resolutions which were adopted:

WHEREAS, The American Pharmaceutical Association from its inception has enrolled as members the most reputable and accomplished pharmacists and druggists in America, who by the character of their annual contributions have made it an ideal organization, and

WHEREAS, One of its founders, the late Prof. William Procter, Jr., became its most distinguished and honored member, through his untiring energy, ability, and valued services to the close of his life.

Therefore, be it *Resolved*, That a Committee of five be appointed by the President, said committee to be known as the Committee on the Wm. Procter, Jr., Monument Fund, whose business it shall be to solicit subscriptions for a memorial monument.

Resolved, That when a sufficient amount shall be collected by subscriptions, this Association shall authorize and have erected in the Smithsonian Grounds in Washington, D.C., a bronze monument, commemorative of the late Wm. Procter, Jr., "The Father of American Pharmacy."

Resolved, That the committee be authorized to invite the co-operation of the various State Pharmaceutical Associations, and all other bodies and individuals in sympathy with the undertaking, and that credit be given to each subscriber.

Resolved, That the American Pharmaceutical Association shall be the custodian of all funds collected, and shall disburse the same for the object herein named, under such rules and regulations as may be adôpted.

Wm. Procter, Jr., was the ninth and youngest child of Isaac and Rebecca Procter. He was born in the City of Baltimore, Md., on the 3d of May, 1817. His paternal ancestor had come from England in 1793, and engaged in the hardware business in Baltimore. He died from yellow fever, three years after the birth of William. When the estate was settled, there was very little money left for his widow to support and educate her children. William, however, possessed industrious and studious habits with accurate observation and good memory, and from his early youth he economized his leisure hours in the pursuit of knowledge. At the age of 14 he engaged himself to Henry M. Zollickoffer, a reputable pharmacist of Philadelphia, Pa., under whose influences, and aided by the solicitude and directions of an educated and good mother, his intuitive mind sought associations that developed a strong character for usefulness.

In 1837 he was graduated from the Philadelphia College of Pharmacy, but remained with Mr. Zollickoffer as assistant and clerk until 1844, when he purchased the property at the S. W. corner of Ninth

and Lombard Streets, and continued in business on these premises until his death in 1874.

In 1840 he was elected a member of his alma mater, and soon became active and influential. His thought and ambition was liberally bestowed on the advancement of pharmacy, and his example in practice was to make it a profession. In 1846 the Chair of Theoretical and Practical Pharmacy was established by the Board of Trustees, and William Procter, Jr., was the only one considered for the position. He was the one member of the college who was preeminently qualified to teach, and by unanimous vote was the first pharmacist elected to a professorship in the oldest college of pharmacy in America. He soon established for himself a character and reputation as a thoroughly qualified teacher.

In October, 1847, he delivered a very interesting and instructive introductory address to his class, which was published in the AMERICAN JOURNAL OF PHARMACY of that year. In 1846 he was elected associate editor of the AMERICAN JOURNAL OF PHARMACY, and in 1850, when Professor Carson resigned the editorship, he was elected to succeed him, being the first pharmacist in America that was elected to the editorship of a pharmaceutical journal. He filled this position with great ability, and made the JOURNAL of practical value to pharmacists and druggists. For twenty years this JOURNAL was under the editorial management of Professor Procter, and its pages proclaim the value of his work to pharmacists. Its general index gives more than seven columns, and about five hundred and fifty items, under his name, exclusive of abstracts from foreign journals and editorials, greatly more than any other contributor, and all of much scientific and practical value. No man of his time could have been more interested in the promotion of pharmacy, and surely no one more qualified.

In 1849 he was the American Editor of Mohr and Redwood's "Practical Pharmacy," which was enlarged by important additions from his pen. In 1851 there was a convention held in New York pursuant to an invitation of the New York College of Pharmacy, the chief object of which was to consult on the questions of standards for the inspection of drugs at the several ports of entry. Important business was transacted at this meeting, and Prof. William Procter, Jr., was the most active delegate in attendance, and in giving shape to the organization. The convention adjourned to meet in Phila-

delphia the following year. In the time that intervened, the mind and pen of Procter were busy making preparations and formulating plans for more perfect organization, and at the meeting he was thoroughly prepared for business, and it was doubtless his thought that brought the American Pharmaceutical Association into active existence. After its organization he was always ready to render assistance, and was the most important factor in its development. No member has ever shown more loyalty and devotion to its service.

He has been the only member who was present at all of the Annual Meetings up to the time of his death, excepting the one that met in 1867 when he was a delegate to the International Pharmaceutical Congress which met in Paris, and the history of his life was largely the history of the organization and the early progress of the American Pharmaceutical Association.

Space will not allow all that might be said in favor of Prof. William Procter, Jr., the peer of American Pharmacists. A review of the pages of the AMERICAN JOURNAL OF PHARMACY, and the proceedings of the American Pharmaceutical Association will more fully express the value of his life-work, and its influence on the higher aims of his chosen profession, which he did so much to honor and extend. His influence for good was not confined to the pharmaceutical guild, but directly and indirectly the profession of medicine was substantially aided in the humane endeavor to cure diseases. He was in no sense a selfish man, and his heart went out to all in sympathy and kindness, but not in a demonstrative manner. What he knew he was ready and willing to impart to others.

In his letter of resignation as editor of the AMERICAN JOURNAL OF PHARMACY presented at a meeting of the Philadelphia College of Pharmacy, December 27, 1870, he states: "It is now thirty-four years since my connection with the AMERICAN JOURNAL OF PHARMACY as a contributor commenced, and about twenty-five years as co-editor and editor. During this period, time and labor have been freely given to make the work a continuous record of the progress of pharmacy at home and abroad. For many years it was a labor of love, and despite the great sacrifices of time occasioned by contributing to its pages the labor was cheerfully given. I need hardly say that it has required an effort on my part to thus voluntarily resign a position fraught with so many pleasant memories."

In an article entitled Pharmaceutical Titles, he writes: " If their possession carried with it the knowledge and dignity which sometimes it is presumed to represent, then titles might well be sought for as desirable evidences of accomplished work. Unfortunately, in many instances there is no relationship."

He had conferred upon him the complimentary title of Doctor of Pharmacy, which he gracefully accepted, but never paraded; his aim was rather to acquire useful knowledge, but he was not a seeker after the titles which he regarded as often misleading. He was devoted to young men who were in search of knowledge, and at the last meeting that he attended of the American Pharmaceutical Association a few months before his death, he read a paper, "Suggestion to Beginners," which illustrates the fact of his continued interest in pharmaceutical students.

William Procter, Jr., has been and ever will be regarded as the ideal representative of American Pharmacy, in the highest sense of public service. His colleagues, the medical profession and the public, owe to his memory a debt of gratitude.

This, we believe, is a matter in which everyone connected with pharmacy should and will take an interest. It is the first attempt made in America to so honor a member of the pharmaceutical fraternity, and the co-operation of all is invited, that the undertaking may prove not only a success, but in order that pharmacists may show to the world that there are those among them worthy of the highest esteem, and that they themselves duly appreciate and honor the leaders in their ranks.

That each may feel a personal interest, it is the purpose of the undersigned Committee to solicit direct or through the auxiliary Committees of the State Pharmaceutical Associations, *individual* subscriptions from every pharmacist and druggist in America, retail, wholesale, and manufacturing, and all others who feel an interest in the elevation and good character of pharmaceutical practice, which Professor Procter did so much to establish. It is earnestly suggested that each pharmacist who subscribes to the Memorial Fund should feel that what he gives represents but a fraction of the benefits conferred by the life work of Professor Procter on every student of Pharmacy in America.

Due acknowledgment will be made to each person on the payment of their subscription as a token of their interest.

John F. Hancock, Chairman, 4 South Howard Street, Baltimore, Md.

Benjamin T. Fairchild, Fairchild Brothers & Foster, New York, N. Y.

Henry Kraemer, 424 South Forty-fourth Street, Philadelphia, Pa.

Frank C. Henry, 703 Fifteenth Street, N. W., Washington, D. C.

C. S. N. Hallberg, N. W. cor. Michigan Blvd. and Twelfth Street, Chicago, Ill.

BOOK REVIEWS.

Squibb's Materia Medica. 1906 Edition. Published annually by E. R. Squibb & Sons, 78–80 Beekman Street, New York.

In this volume of nearly 400 pages is an alphabetical list of all the Squibb products, embracing the articles in the U. S. Pharmacopœia (Eighth Revision) and the National Formulary, together with the non-official chemicals, pharmaceuticals and newer remedies in general use, setting forth their origin, Latin and English titles, synonyms, physical and chemical characteristics, incompatibilities, antidotes, therapeutic indications, doses, etc. In Part II is also given a list of cultures of bacteria, culture media, staining solutions, tables of equivalents of the metric system in avoirdupois and apothecaries' weights and measures, percentage solutions, and glossary of therapeutic terms.

The book contains a large amount of valuable information and will be found useful to both physicians and pharmacists.

PHILADELPHIA BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The second stated meeting of the Philadelphia Branch of the American Pharmaceutical Association was held on the evening of Tuesday, April 24, 1906, the first vice-president, Mr. William McIntyre, presiding.

The discussion on "The immediate object and the aims of the Philadelphia Branch of the American Pharmaceutical Association" was opened by Mr. Joseph L. Lemberger, of Lebanon, the president of the American Pharmaceutical Association. Mr. Lemberger

spoke on the suggestion "To foster fraternal relations between members of the pharmaceutical profession." In this connection Mr. Lemberger referred to the imperative need for association and expressed the opinion that the development of the idea of local branches of the American Pharmaceutical Association will have a tendency to bring local pharmacists together to discuss matters relating to the professional side of their calling and will, in turn, serve to impress physicians with the abilities and accomplishments of the younger generation of pharmacists.

Mr. William L. Cliffe, in support of his suggestion "To endorse and to assist in the present movement for higher educational requirements for pharmacists," said that in his capacity as a member of the State Board of Pharmacy he deeply felt that the education of the pharmacist had not progressed in the same ratio as the need for education. The demand for increasing the educational qualifications of prospective pharmacists was, therefore, an imperative one and one that should be recognized and provided for.

Mr. Franklin M. Apple, the next speaker, suggested that it would be desirable to co-operate with physicians to prevent the indiscriminate renewal of prescriptions. This practice he believed had been productive of much misunderstanding and had no doubt led to abuses that should be corrected.

Mr. O. W. Osterlund suggested the cultivation of friendly relations between physicians and pharmacists and expressed the opinion that in the greater number of instances suggestions and corrections would be kindly received by physicians and would, in turn, serve to impress on the latter a recognition of the need of practical assistance and advice.

Mr. John K. Thum expressed the belief that the most desirable way of promoting the welfare of the average pharmacist would be found in fostering and developing the professional side of pharmacy. This, he asserted, could be best accomplished by securing the co-operation of all reputable pharmacists to work together for the common good.

Additional suggestions were made by Messrs. England, Peacock, Hunsberger, Dr. Weidemann and Professor Kraemer.

Professor Kraemer suggested the advisability of giving publicity to the deliberations of the local branch and of taking an active interest in matters of public concern that might in any way improve

the professional standing of members of the pharmaceutical profession. In this connection he called attention to the need for endorsing and assisting the Council on Pharmacy and Chemistry of the American Medical Association.

The several suggestions that had been made in the course of the evening, with some additional ones that had been offered in writing, were referred to a committee of three to report at the next meeting.

The next meeting of the Philadelphia Section of the American Pharmaceutical Association will probably be held on the evening of Monday, May 21, 1906, in the Hall of the College of Physicians.

M. I. WILBERT, *Secretary.*

PHILADELPHIA COLLEGE OF PHARMACY.

THE EIGHTY-FIFTH ANNUAL COMMENCEMENT.

The eighty-fifth annual commencement of the Philadelphia College of Pharmacy was held in the American Academy of Music, corner of Broad and Locust Streets, Thursday evening, May 17th. After prayer by the Rev. Edwin Heyl Delk, D.D., the degrees were conferred by the president of the college, Howard B. French.

The following are the names of those receiving the degree of Doctor in Pharmacy (P.D.), together with the subjects of their theses:

Name.	*Thesis.*	*State or Country*
Albert, Henry Clay, P. C.,	Lime Water and Lime Water Tablets,	New Jersey
Allen, John Harvey,	Glyceritum Boroglycerini,	Delaware
Anawalt, Robert Bunn,	The Soda Fountain,	Pennsylvania
Andrews, Joseph Colson,	The Marvels of Coal Tar,	New Jersey
Ayres, Wilmot,	The Pharmacist and His Specialties,	Pennsylvania
Baskin, Ancy Lonza,	The Art of Making Compressed Tablets,	South Carolina
Bell, Frances Rose,	Brown Mixture,	Pennsylvania
Bender, William Lawrence,	Cod Liver Oil,	Pennsylvania
Betts, John Alvin,	Hydrastis,	Delaware
Bienkowski, Peter Thomas,	Spiritus Ammoniæ Aromaticus,	Pennsylvania
Blinzig, Frederick John,	Liquor Magnesii Citratis,	Pennsylvania
Bragdon, Clarence Eugene,	The Paper Industry,	Maine
Brubaker, Elam,	Oleum Theobromatis,	Pennsylvania
Burgoon, William David,	Formaldehyde,	Pennsylvania
Burns, Helen Ritz,	A Pessimistic *vs.* An Optimistic View of Pharmacy,	Pennsylvania
Butler, Samuel Sumter,	Fluid Extracts,	New Jersey

Name.	*Thesis.*	*State or Country.*
Butter, Franklin Alfred,	Sodii Boras and Acidum Boricum,	California
Carl, Frank William,	Hydrastis and Its Cultivation,	Pennsylvania
Cheney, Frank Lester,	Extemporaneous Sulphurous Acid,	Vermont
Coles, Clawson Samuel,	India Rubber: Its Origin and Preparations,	New Jersey
Cook, Elliott Daniel,	Shall the Drug Store Close on Sunday?	New Jersey
Crouse, George Francis,	Sodii Sulphis. Sodii Bi-sulphis,	Pennsylvania
Cunningham, Milton Hart,	Cod Liver Oil,	New Jersey
Davy, George Covell,	Water,	Pennsylvania
Dawson, John Douglas,	Disinfection,	Illinois
DuBois, George Stanley,	Magnesii Carbonas,	Kentucky
Eadie, Erma Delia,	Cascara Sagrada,	Pennsylvania
Earl, Franklin Wallace,	The Aromatic Medicated Waters, U.S.P.,	New Jersey
Eckenroth, Charles Wm.,	Acidum Tannicum,	Pennsylvania
Evans, Charles Wilson,	India Rubber: Its Origin and Preparations.	Pennsylvania
Fahr, Harry Miller,	Suppositories,	Pennsylvania
Feigley, Harvey Peter,	Magnesium Sulphate,	Pennsylvania
Fernandez, Manuel,	History of the Zinc Industry,	Cuba
Flack, Herbert Lewis,	Cataplasma Kaolini,	Maryland
Fogg, Frank Carroll,	Tablet Manufacture,	New Jersey
Fogg, Frank Garfield,	Mercurial Ointment,	New Jersey
Forrest, Ralph Anderson,	The European Source of Drugs,	New Hampshire
Foster, Wm. Wetheral, Jr.,	Suppositories,	Pennsylvania
Goodyear, Wilbur Bair,	Tinctura Cardamomi Composita,	Pennsylvania
Goss, Lloyd Earl,	Sodium Phosphate,	Pennsylvania
Grammer, Charles Roy,	Kaolin,	Pennsylvania
Green, Francis,	Asbestos,	New Jersey
Greyer, Charles Peyton,	Jalapa,	Virginia
Grim, Herman Charles,	Strophanthus Kombe,	Pennsylvania
Haley, George Benjamin,	Tem-Piah-Ute,	Idaho
Hancock, Godfrey Olin,	Ferri Carbonas Saccharatus,	New Jersey
Haws, James William,	Hydrargyrum,	Pennsylvania
Henry Harvey Abner,	Zea Mays,	Pennsylvania
Herr, Jason Adam,	Use of Glycerin in Pharmaceutical Preparations,	Pennsylvania
Hoenstine, John Calvin,	Glyceritum Phenolis,	Pennsylvania
Hoffman, Wm. Christopher,	Cannabis Indica,	New Jersey
Hughes, Harry Caswell,	Elixir Ferri Quininæ et Strychninæ Phosphatum,	Pennsylvania
Hurst, Benjamin Russell,	Liquor Magnesii Citratis,	Pennsylvania
Irvin, Samuel Miles,	Mercury,	Pennsylvania
Irwin, James Franklin,	Aqua Acidi Carbonici,	Pennsylvania
Jenkins, Benjamin Herr,	Sucrose and Its Detection,	Kentucky
Jessup, Walter,	Digestive Ferments and Their Uses,	New Jersey
Jones, Evan Albert,	Rhubarb,	Pennsylvania

Name.	*Thesis.*	*State or Country.*
Kelty, Frederick Brauns,	Thymol Iodide,	New Jersey
Kettl, Robert Michael,	Test for the Detection of Rosin,	Pennsylvania
Laubach, Edwin John,	Zinc and Its Official Salts,	Pennsylvania
Lloyd, Harry Ashton,	Antitoxin,	Pennsylvania
McClements, Oliver B.,	Olive Oil,	Pennsylvania
Mann, Charles,	Rhamnus Purshiana,	Pennsylvania
Mehring, Chas. Augustus,	Shall Physicians dispense?	Pennsylvania
Medrano, Joaquin Higinio,	Micro-Pharmacy,	Cuba
Metz, John Bowman,	Scopolamine,	Pennsylvania
Monaghan, Chas. Aloysius,	A Modern Drug Label,	Pennsylvania
Moore, James Kulp,	Emergency Antidotes for Poisons,	Pennsylvania
Olewiler, George Irwin,	Eucalyptus,	Pennsylvania
Orrick, Walter Harper,	Belladonna,	Pennsylvania
Peters, Harold Frederick,	Vegetable Digestive Ferments,	Pennsylvania
Pfeiffer, George Louis,	Diphtheria Antitoxin,	Pennsylvania
Platt, George Hilyard,	Hydrastis,	Delaware
Portugal, José Agustin,	Incompatibility of Quinine Sulphate with the Liberation of Hydrogen Sulphide,	Peru
Reese, Chas. Hoffman,	Gossypium Purificatum and its Uses,	Pennsylvania
Reisch, Wm. Henry,	Is Pharmacy a Profession or Trade?	Pennsylvania
Renwer, Henry George, Jr.,	Refilling of Prescriptions,	Pennsylvania
Richards, Herbert Leonard,	Coca,	Pennsylvania
Riley, William Guy,	Serum Antidiphthericum,	W. Virginia
Roach, Jeremiah Thomas,	Lactucarium: Its Production and Uses,	Pennsylvania
Robinson, Paul Patton,	Cinchona,	N. Carolina
Russell, Hamilton,	Liquor Magnesii Citratis,	Florida
Scatchard, Elmer E.,	Glycerinated Gelatin Suppositories	New York
Schlitzer, William Frank	Phosphorus,	Pennsylvania
Schomo, Chas. Cornelius,	Sodium Phosphate,	Pennsylvania
Schrader, Curtis Fink,	Phenol,	Pennsylvania
Schwenzer, Carl Wilhelm,	The Improved Spatula,	Indiana
Sharp, Raymond,	Vaccine Virus,	New Jersey
Shear, Lewis Maurice,	Ergot,	Pennsylvania
Shearer, Wm. Reuben,	Liquor Chlori Compositus,	Pennsylvania
Shiffer, Abraham Milton,	Liquor Magnesii Citratis,	Pennsylvania
Shirer, Arthur Enos,	Dried Sulphate of Iron,	Pennsylvania
Shrom, Joseph Alexander,	The History of Antitoxin,	Pennsylvania
Slayton, Edmond Elliott,	Maple Sugar Industry,	Vermont
Slifer, Edward Wilson	Shop and Show Fixtures,	Pennsylvania
Staver, Guy,	Vanillinum,	Pennsylvania
Stouffer, James Cochran,	Cascara Sagrada,	Pennsylvania
Sunday, Harry James,	Berberis,	Pennsylvania
Taylor, Frank Cochran	History of Pharmacy,	Indiana
Thomas, Edward Sutton,	The History of Cinchona,	Pennsylvania
Thomas, Frederick Wm.,	Antiseptics,	W. Virginia

Name.	*Thesis.*	*State or Country.*
Thompson, Wilfred S.,	Liquor Plumbi Subacetatis,	N. Brunswick
Thorley, Samuel Early,	Ammonia Water,	Pennsylvania
Traul, Glenwood Elmo,	Creosote,	Ohio
Walther, Raymond Jos.,	Perfume,	Pennsylvania
Whitacre, Henry W.,	The Pharmacist,	New Jersey
Wilkins, Edwin Elmer,	A Practical and Inexpensive Prescription Cabinet,	New Jersey
Wilkinson, Harry Darnell,	Coca,	New Jersey
Wolf, Raymond John,	The Druggist's Own Preparations,	Pennsylvania
Yost, Frederick Randolph,	A Non-refillable Bottle	Pennsylvania

The following are the names of those receiving the degree of Pharmaceutical Chemist (P. C.), together with the subjects of their theses:

Name.	*Thesis.*	*State or Country.*
Broadbelt, George Harold,	Adulteration and Substitution,	Pennsylvania
Camp, Walter Samuel,	Cotton Root Bark,	Texas
Haines, William Henry,	Pills in General,	New Jersey
Seidman, Harry,	Diluted Acetic Acid,	Russia
Whaland, Berta,	The Rancidity of Fats,	Pennsylvania

The following members of the class were awarded the certificate of Proficiency in Chemistry:

Name.	*State.*
Carlin, Joseph C.	Pennsylvania
Handwork, Francis Collins	Pennsylvania
Heinle, Charles Jacob	Pennsylvania
Hile, Merrill Baird	Pennsylvania
King, William Henry	New Jersey
Roberts, Joseph Griffith	Pennsylvania
Steigerwalt, Frederick Wm.	Pennsylvania
McCambridge, John Edmund, Jr.	Pennsylvania

There were one hundred and twenty-four members of the graduating class coming from various States and countries as follows: California, 1; Cuba, 2; Delaware, 3; Florida, 1; Idaho, 1; Illinois, 1; Indiana, 1; Kentucky, 2; Maine, 1; Maryland, 2; New Brunswick, 1; New Hampshire, 1; New Jersey, 20; New York, 1; North Carolina, 1; Ohio, 1; Pennsylvania, 75; Peru, 1; Russia, 1; South Carolina, 1; Texas, 1; Vermont, 2; Virginia, 2; and West Virginia, 1.

The valedictory address was delivered by the Hon. Robert Adams, Jr. (since deceased).

AWARD OF PRIZES.

The dean, Prof. Joseph P. Remington, announced that the following members of the class received the grade of distinguished:

George Stanley DuBois and Berta Whaland; and the following that of meritorious: Herbert Louis Flack, Charles Roy Grammer, José Agustin Portugal, Hamilton Russell, Elmer Ellsworth Scatchard and Charles Cornelius Schomo.

THE WM. B. WEBB MEMORIAL PRIZE, a gold medal and certificate, offered for the highest general average in the branches of committee, operative pharmacy and specimens, was awarded to Franklin Alfred Butter, the presentation being made by the treasurer of the College, James T. Shinn, Ph.M. The following graduates received honorable mention in connection therewith: George Stanley DuBois and Elmer Ellsworth Scatchard.

THE PHARMACY PRIZE, a gold medal offered by Prof. Joseph P. Remington, for original pharmaceutical work, was awarded to Berta Whaland.

THE CHEMISTRY PRIZE, of $25, offered by Prof. Samuel P. Sadtler, for knowledge of quantitative chemical analysis, was awarded to William Reuben Shearer.

THE MATERIA MEDICA PRIZE, of $15, offered by Prof. Clement B. Lowe, for the best examination in materia medica and in the recognition of materia medica specimens with a meritorious thesis, was awarded to Herbert Leonard Richards. The following graduates received honorable mention in connection therewith: Robert Bunn Anawalt, Wilmot Ayres, Harvey Peter Feigley, Chas. Roy Grammer, and William Christopher Hoffman.

THE MICROSCOPICAL RESEARCH PRIZE, a Zentmayer microscope, offered by Prof. Henry Kraemer, for the best thesis involving microscopical research, was awarded to Berta Whaland. The following graduates received honorable mention in connection therewith: George Covell Davy, Jason Adam Herr, Joaquin Higinio Medrano, and Hamilton Russell.

THE OPERATIVE PHARMACY PRIZE, of $20 in gold, offered by Prof. Joseph P. Remington, for the best examination in operative pharmacy, was awarded to Hamilton Russell, the presentation being made by the recording secretary of the College, Dr. C. A. Weidemann. The following graduates received honorable mention in connection therewith: Frederick John Blinzig, Clarence Eugene Bragdon, William David Burgoon, Oliver Beckett McClements, George Louis Pfeiffer, Elmer Ellsworth Scatchard, Carl Wilhelm

Schwenzer, Lewis Maurice Shear, Abraham Milton Shiffer and Guy Staver.

The Maisch Prize, of $20 in gold, offered by Mr. Jacob H. Redsecker, of Lebanon, Pa., for histological knowledge of drugs, was awarded to Bobert Bunn Anawalt, the presentation being made by J. L. Lemberger, Ph.M., President of the American Pharmaceutical Association. The following graduates received honorable mention in connection therewith: Wilmot Ayres, Harvey Peter Feigley, William Christopher Hoffman, and Herbert Leonard Richards.

The Theoretical Pharmacy Prize, a Troemner agate prescription balance, offered by Mr. Mahlon N. Kline, for the best examination in theory and practice of pharmacy, was awarded to George Stanley DuBois. Berta Whaland received honorable mention in connection therewith.

The Commercial Training Prize, of $20 in gold, offered by Prof. Joseph P. Remington, to the graduate who passed the best examination in commercial training at the final examination for the degree, was awarded to George Stanley DuBois, the presentation being made by Walter A. Rumsey, a member of the Board of Trustees. The following graduates deserved honorable mention in connection therewith: Robert Bunn Anawalt, Joseph Colson Andrews, Franklin Alfred Butter, Walter Samuel Camp, Frank William Carl, Frank Lester Cheney, Charles Roy Grammer, Harry Ashton Lloyd, Joaquin Higinio Medrano, José Agustin Portugal, Herbert Leonard Richards, Elmer Ellsworth Scatchard, Charles Cornelius Schomo, Edward Sutton Thomas, Hamilton Russell, Wilfred Steadman Thompson, and Frederick Randolph Yost.

The Instructors' Prize, of $20, offered by the Instructors of the College, for the highest term average in the branches of pharmacy, chemistry and materia medica, was awarded to José Agustin Portugal, the presentation being made by Freeman P. Stroup, instructor in chemistry. The following graduates deserved honorable mention in connection therewith: George Stanley DuBois and Charles Roy Grammer.

The Pharmacy Quiz Prize, one year's membership in the American Pharmaceutical Association, offered by Prof. Charles H. LaWall, for the best term work in theory and practice of pharmacy, was awarded to Herbert Louis Flack. The following graduates received honorable mention in connection therewith: Walter Samuel Camp,

Charles Mann, José Agustin Portugal, Raymond Sharp and Joseph Alexander Shrom.

THE KAPPA PSI FRATERNITY PRIZE, of $20 in gold, offered by the Eta Chapter of the Kappa Psi Fraternity to the graduate making the highest general average during the three years' course at the College, was awarded to Berta Whaland, the presentation being made by Dr. Adolph W. Miller, corresponding secretary of the college. The following graduates deserved honorable mention in connection therewith: Franklin Alfred Butter, George Stanley DuBois, Herbert Louis Flack, José Agustin Portugal, Elmer Ellsworth Scatchard, and Frederick Randolph Yost.

COMPLIMENTARY SUPPER GIVEN BY THE FACULTY.

On Wednesday evening, May 16th, a complimentary supper was tendered the graduating class by members of the Faculty. The supper was given in the museum of the college, and among the invited guests were some of the officers and members of the college. The dean of the Faculty, Professor Remington, acted as toastmaster and short speeches were made by members of the Faculty and Instructors, some of the members of the Board of Trustees and quite a number of the members of the graduating class.

BACCALAUREATE SERMON.

Baccalaureate services were held in the Church of St. Luke and the Epiphany on Sunday afternoon, May 13th, the sermon being delivered by the rector, the Rev. David M. Steele.

ALUMNI ASSOCIATION.

The annual meeting, the annual reception to the graduating class and annual dinner of the Alumni Association of the Philadelphia College of Pharmacy were held during commencement week, and an account of these will be furnished later by the secretary of the Association.

NOTES AND NEWS.

THE WELLCOME HISTORICAL EXHIBITION of rare and curious objects relating to medicine, chemistry, pharmacy and the allied sciences is to be held in London shortly. The exhibition is organized by and under the direction of Henry S. Wellcome, Ph.M., and will be divided into sixteen sections. It is expected that the exhibition will reveal many facts and will elucidate many obscure points in connection with the origins of various medicines and in respect to the history of diseases. Articles of exceptional interest have been promised from different quarters of the globe, and altogether the exhibit promises to be of great value in connecting the more or less isolated and scattered historical data relating to the development of medicine. All communications respecting the Historical Medical Exhibition should be addressed to Henry S. Wellcome, Snow Hill Buildings, London, E. C., England.

PERKIN MEMORIAL AND JUBILEE OF THE COAL-TAR COLOR INDUSTRY.—The year 1906 marks the fiftieth anniversary of the epoch-making discovery by William Henry Perkin of the dye-stuff "Mauve," by which the foundation was laid of the coal-tar color industry and a great stimulus given to the study of organic chemistry. It has been widely felt that the jubilee of the foundation of this important industry should be made the occasion of a fitting public tribute to its founder, in recognition of the great services he has rendered to chemical industry and chemical science by his life work.

A general committee has been appointed in England to arrange for the celebration and is composed of many prominent men, including Dr. F. B. Power, Director of the Wellcome Research Laboratories. The Chemists' Club, of New York City, held a public meeting on April 7th to consider what steps should be taken to give effect to the suggested Perkin jubilee celebration. A large committee of representative men was appointed to make arrangements for a simultaneous celebration in this country. Among the members of this committee are Prof. Charles F. Chandler, Dr. A. R. L. Dohme, Mr. Samuel W. Fairchild, Mr. Albert Plaut, Prof. Samuel P. Sadtler, and Dr. Jokichi Takamine.

PROF. JOSEPH P. REMINGTON, chairman of the Committee on Revision of the United States Pharmacopœia, delivered the valedictory address at the commencement exercises of the St. Louis College of Pharmacy on Wednesday evening, April 25, 1906.

PROF. HENRY H. RUSBY delivered an address on "The History of Botany in New York" at the celebration of the tenth anniversary of the New York Botanical Garden on Wednesday, May 23d. The address was followed by an informal reception in the museum halls, library and laboratories.

DR. JOKICHI TAKAMINE has had conferred upon him by His Majesty the Emperor of Japan, the decoration of the "Order of the Rising Sun," in recognition of his scientific work and attainments.

PROF. OSCAR OLDBERG has written a valuable paper on "The Systematic Amendment of American Pharmacy," which recently appeared in the *American Druggist*, Vol. xlviii, Nos. 2, 3, 4 and 7. All those interested in pharma-

ceutical education and the true advancement of pharmacy will find this article, of which reprints have been made, of great interest.

PROF. WILLIAM M. SEARBY was one of the chief sufferers from the fire following the recent earthquake in California. In a note from him, dated May 11th, he writes: "I lost everything by the fire, but worst of all my library, records, data, etc. But I am well and never was in better spirits."

PENNSYLVANIA PHARMACEUTICAL ASSOCIATION.—The twenty-ninth annual meeting will be held in the Glen Summit Springs Hotel, Luzerne County, June 26, 27 and 28, 1906. The first session will be opened on Tuesday, June 26th, at 2.30 P.M.

The hotel where the meeting will be held is first class in all its accommodations, and is located amidst the most magnificent mountain scenery to be found in the country. It is 2,000 feet above the level of the sea, on the crest of Mt. Nescopec, in the hill country of northeastern Pennsylvania. The attendance this year will be large. There will be valuable reports presented, and interesting papers read and discussed. The officers of the Association urge all the members to come, especially those who have never attended a meeting. Mr. George P. Raser, Local Secretary, 429 Arch Street, Philadelphia, has charge of all the local arrangements for the meeting.

OHIO STATE PHARMACEUTICAL ASSOCIATION.—The twenty-eighth annual convention will be held in Cedar Point, on Lake Erie, Ohio, on the 26th, 27th, 28th and 29th of June, 1906, with headquarters at the Breakers' Hotel.

A special train will leave the Grand Central Depot over the Big Four Railroad at 8.10 A.M., Tuesday morning, the 26th of June. This train will carry the Cincinnati delegation through without change to Sandusky. Take the boat at Cedar Point dock. For further particulars and schedule of other delegations address: George B. Kauffman, Columbus Delegation, Front and Chestnut Streets, Columbus, O.; Eugene R. Selzer, Cleveland Delegation, Superior Street, Cleveland, O.; T. B. Huston, Toledo Delegation, Toledo, O.; Frank Amann, Portsmouth Delegation, Portsmouth, O.; H. F. Vortkamp, Lima Delegation, Lima, O.; W. M. Beal, Eastern Delegation, Steubenville, O.; C. S. Ashbrook, Northeastern Delegation, Mansfield, O.

THE MISSOURI PHARMACEUTICAL ASSOCIATION meets at Pertle Springs (Warrensburg), June 12th to 15th inclusive. In addition to the usual interesting and varied programme, the Committee on U.S.P. will this year occupy much of the time and attention of the convention. Chairman William Mittelbach, of Booneville, has arranged for a display of all of the U.S.P. VIII drugs. These will be examined and discussed from the standpoint of the retail druggist and by representatives of the Pharmacopœia. Chemical, microscopical, polariscopic and other tests will be made and discussed.

SECTION OF PRACTICAL PHARMACY AND DISPENSING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.—The officers of the Section of Practical Pharmacy and Dispensing cordially invite the co-operation of all retail pharmacists in the work of this section.

Ever since the establishment of the Section great interest has been manifested in the presentation and discussion of difficult and odd prescriptions. The Committee, therefore, have decided to continue this work and make the participation in it as broad and general as possible.

The Committee further believe that a discussion of some of the new preparations of the Pharmacopœia would be of interest and benefit and therefore invite pharmacists to bring with them to the next meeting samples of the following preparations, coming from their own laboratories: cataplasm of kaolin, elixir adjuvans, elixir and glycerite of the phosphates of iron, quinine and strychnine, antiseptic solution, compound cresol solution, compound solution sodium phosphate, effervescing sodium phosphate, compound syrup of hypophosphites, or any other preparation not mentioned

The Committee also invites members most cordially to write and present a paper on any subject that they may select, relating to the practice of pharmacy and dispensing. Manuscripts must be sent to the chairman of the section at least six weeks before the meeting in order to have them printed in time.

The Committee desire to remind the members that for the best paper or collection of notes read before this Section, Mr. Enno Sander offers the yearly prize of $50.00

The Committee on Practical Pharmacy and Dispensing: Wm. C. Alpers, Chairman, New York; Wm. O. Gross, Associate, Ind.; and H. A. B. Dunning, Secretary, Baltimore, Md.

UNITED STATES PHARMACOPŒIAL CONVENTION.—The sixth annual meeting of the Board of Trustees was held at Washington, D. C., April 28th, with Dr. J. H. Beal, Chairman, Charles E. Dohme, Professor J. P. Remington, Mr. S. A. D. Sheppard and Dr. H. M. Whelpley present.

Progress was reported on a Spanish translation of the Pharmacopœia, but no date was set for its appearance.

The by-laws provide that "the Committee of Revision shall receive such nominal compensation for their services as the board of trustees shall direct." At a previous meeting, the board had voted the sum of $200 for each member of the committee of revision. The board decided that certain members of the committee, having performed exceptional services in connection with the work of revision, should receive additional payments of honoraria, the list being as follows: Charles Caspari, Jr., V. Coblentz, C. Lewis Diehl, Alfred R. L. Dohme, Walter S. Haines, C. S. N. Hallberg, Henry Kraemer, Edward Kremers, A. B. Lyons, H. H. Rusby, Samuel P. Sadtler, W. L. Scoville, E. H. Squibb and A. B. Stevens. The by-laws provide that the members of the board of trustees shall not receive compensation for their services.

THE AMERICAN
JOURNAL OF PHARMACY

JULY, 1906.

COMMENTS UPON THE U.S.P. INORGANIC CHEMICALS.

By Virgil Coblentz.

Before taking up the work of revision, the first duty that confronted our Committee was the selection of the standard for atomic weights. At that time (Summer of 1900) there was little choice, since the standard of O = 16 had been but recently proposed for general adoption among chemists, and the system of H = 1 had always been employed in previous pharmacopœial revisions. Owing to the fact that the majority of chemists, especially teachers, favored the old standard, and since it was impossible for us to delay our work until this matter was settled, the more conservative plan was adopted in retaining H = 1. After having once entered fully into the task of revision any change was out of the question. Chemists will continue to wrangle over this subject in the future as in the past, possibly by 1910 an agreement may be reached in accepting the O = 16 standard which gives us figures more convenient for practical purposes.

During the last decade, many marked changes in manufacturing processes for the production of various chemicals have been made; this is particularly the case with the alkalies, alkaline earths and acids. Most of these changes are due to the introduction of electrolytic processes which invariably furnish purer products, justifying therefore a raising of the standards of purity of all chemicals derived directly or indirectly from such.

Many of the *general* tests of the old pharmacopœia were unnecessarily sensitive, while others lacked in uniformity of description and application. Further, the requirements for the absence of certain innocuous impurities imposed unnecessary hardships upon

both the manufacturer and consumer. The tests described under many of the chemicals left one in doubt as to the percentage purity required. Therefore, in order to secure uniformity and to avoid misconstruction of the intentions of the text, the Purity Rubric was adopted for all inorganic chemicals. The following represents an outline of the general changes adopted:—

(1) It was resolved to ignore the presence of all innocuous impurities which usually occur in small quantities in medicinal chemicals, so long as the substance otherwise complied with the limits of purity demanded.

For example, the presence of chlorids, sulfates, sodium or calcium in the salts of the alkalies. If a potassium bromid contains of the pure salt 97 per cent., or potassium acetate 98 per cent., or potassium carbonate 94 per cent., it is immaterial, so far as their medicinal uses are concerned, whether they contain these harmless impurities or not.

(2) To drop all flame tests for the presence of *sodium* in potassium salts. This extremely sensitive test demands a degree of purity which is practically unattainable and unnecessary.

(3) To establish the limit of purity of each chemical, which is to be stated (as rubric) in long primer type directly under the title.

(6) To revise the tests (with reference to uniformity and sensitiveness) for the presence of poisonous metals. This is more particularly applicable to those chemicals which are administered frequently and in large doses extending over longer periods of time. For example, such salts as sodium phosphate, the hypophosphites, sulfates, acetates, etc. Furthermore,

(7) *Estimation of Organic Salts of the Alkalies.*—In the estimation of the organic alkali salts, instead of employing a molecular quantity of the chemical as was directed in the U.S.P. 1890, whereby the number of cubic centimeters of volumetric solution consumed represented the percentage purity, an even quantity, namely 1 gramme, has been adopted in the present revision. With the atomic weight system ($H = 1$) as at present adopted, the former plan was found to be objectionable because in nearly all cases the molecular equivalent weights represent fractions which are impossible to weigh without an accurate analytical balance. For example, sodium acetate 1·351 gramme would require (according to U.S.P., 1890),

9·95 c.c. of N/1 H_2SO_4, or 0·6755 gramme, 9.95 c.c. of N/1 H_2SO_4 corresponding to a 99·5 per cent. salt. If, on the other hand, an even weight, as 1 gramme of the salt (U.S.P., 8th Rev.), which can be weighed with accuracy upon a prescription balance, be taken, we are confronted with the difficulty of measuring fractions of a cubic centimeter. Thus 1 gramme of sodium acetate (99·5 per cent.) should require 14·74 c.c. of N/2 sulfuric acid. Since 1 c.c. pipettes (graduated to hundredths) are cheaper than analytical balances, such fractions of a cubic centimeter can if desired be measured, otherwise the nearest whole number may be accepted. The pharmacopœial text must be accurate and express its standards accordingly, the operator may interpret to suit the case in question.

(8) *Time Limit Test for Metals.*—Referring to the old sulfureted hydrogen test for the presence of undesirable metallic impurities, criticisms have frequently been made of the lack of uniformity in the description and method of application as given in the text of the last revision.

It has been further noted that contrary to analytic procedure, neither *time* nor *temperature* were considered in applying this test for the presence of traces of metals, precautions which are especially necessary in testing for arsenic, which when present in the "ic" condition must first undergo reduction to the "ous" state, before any reaction can take place. It was decided to substitute for this the "time-limit test for the presence of poisonous or undesirable metallic impurities." The limit in this test is intended to be about 1 part in 100,000.

"A solution of the salt or acid in distilled water (1 in 20), when the former is slightly acidulated with an acid, should not be colored or rendered turbid by an equal volume of freshly prepared hydrogen sulphide T. S., after standing well-stoppered in a warm place for at least half an hour, either before or after the addition of ammonia water to slight alkalinity." After the lapse of one-half hour and before the addition of the ammonia water, the mixture should possess the distinct odor of H_2S, if not, it should be thoroughly saturated with the gas and again set aside for half an hour.

(9) *Special Tests for Arsenic.*—The last revision recognized *five* different tests for the presence of arsenic; of these but two were employed in the text proper, namely, the sulfureted hydrogen and Bettendorf's, while the Fleitman, Fleitman-Gatehouse and

Gutzeit tests were given as alternate methods, the latter being intended more particularly for the testing of reagents.

While absolute freedom from arsenic is neither attainable nor desirable, yet under no circumstances should consideration of commercial advantages as to the cheapness or the convenience of manufacturers deter us from guarding most carefully public health and safety. It is conceded by all that arsenic is present in infinitesimal traces in almost every chemical and article of food, hence it remains for us to discriminate between preventive and non-preventive contamination as to the limits permissible. While numerous cases of arsenical poisoning through chemicals and food-stuffs have occurred recently in England, and a repetition in this country is not probable, yet we must not overlook this possibility in important chemicals. As all are aware, this trouble arose through the employment of arsenical pyrites in the manufacture of sulfuric acid. Dr. Hehner (*Jour. Soc. Chem. Ind.*, 1901, 188) has estimated that no less than 1,800 tons of arsenous acid are distributed in the one million tons of sulfuric acid annually produced in England. This acid is employed directly or indirectly in the preparation of all acids and hundreds of chemicals, among which we find glycerin, glucose, borax, boric acid, ferrous sulfate and preparations made from it, sodium phosphate, sodium and potassium carbonate and acetate, phosphorus, phosphates, hypophosphites, etc.

Based on an extensive experience in arsenic testing, Dr. Hehner considers that a sample of sulfuric acid may be considered as dearsenicated if it contains not more than 1 part of arsenous acid (As_2O_3) in 200,000 (0·0005 per cent.) or 0·05 milligramme in 10 grammes. (No difficulty has been found in obtaining samples of acids of American source which withstood the Marsh test for fifteen minutes.)

British chemists have generally agreed upon fixing the limit at 0·001 gramme of As_2O_3, to the gallon for beverages, or pound for foods (*Jour. Soc. Chem. Ind.*, 1901, 193, *et seq.*), corresponding to 1 part in about 450,000.

As to chemicals, the Phar. Br. demands practically entire freedom, which certainly is entirely too stringent when arsenic can be demonstrated to the seventh place of decimals. Dr. Curtman (in the *Pharm. Rundschau*, 1891, p. 175) placed a limit (U.S.P., 1890) of $\frac{1}{100}$ per cent., which would be equivalent to 1 part of arsenous

oxid in 10,000. While this may suffice for all chemicals which are given in moderate doses, yet there are instances in which it is evidently excessive, as, for example, such salts as sodium phosphate, sodium sulfate, acetates, also sulfur, which are usually given in large doses, frequently extending over considerable periods of time.

With the limit set at $\frac{1}{100}$ per cent., or one part in 10,000, in each ounce of these chemicals, about 3 milligrammes, or $\frac{1}{20}$ of a grain, of arsenous acid would be permissible, and considering that some of these are given in doses of from ½ to 2 ounces, frequently repeated, it is apparent that this limit is too low.

Berzelius-Marsh Test.—This test, originally devised by Dr. Marsh, who directed that a cold porcelain surface be held over the burning jet of hydrogen, was modified and improved by Berzelius, in directing the heating of the tube through which the arsine gas passed, for the production of the well-known metallic mirror. The chief difficulties encountered in this test, as well as all others based on the generation of arsine, has been in securing samples of zinc sufficiently pure and free from arsenic, sulfur, phosphorus and iron. At present very pure samples of zinc are readily attainable at a moderate cost. Such zincs contain only *traces* of iron, larger quantities interfere seriously with the test, since iron tends to form an insoluble and undecomposable arsenid. Other criticisms which have been made of this well-known test have been met in the form of apparatus and procedure, so accurately described, even to the minutest details, by the Joint Committee Report of the Society of Chemical Industry and the Society of Public Analysts (*Jour. Soc. Chem. Ind.*, 1902, p. 94). This test as recommended will indicate the presence of 1 part of arsenous oxide in 7,000,000, representing $\frac{1}{1000}$ of a grain per pound or $\frac{1}{100}$ of a grain in one gallon of fluids. O. Hehner states that 0·001 milligramme of As_2O_3 will give a distinct mirror in the tube, in 15 minutes, and this when heated, forms crystals of As_2O_3, which are distinguishable with the naked eye.

The presence of quantities of selenous acid has been found to interfere with the formation of the mirror. This test is too sensitive for general and pharmacopœial purposes.

Gutzeit's Silver Test, U.S.P. (1890).—The delicacy of this test is such that 0·001 milligramme of As_2O_3 will give a faint yellow spot which turns brown on wetting, after having exposed the paper cap, moistened with silver nitrate, to the action of mixed hydrogen and

arsine gases for half an hour. (Flückiger, *Archiv d. Pharm.*, 27, p. 1. Poleck, *ibid.*, p. 3, and Curtman, *Pharm. Rundschau*, 1891, p. 178.) That is, provided all of the arsenic has been converted into arsine. Reichert (Reichert, *Archiv d. Pharm.*, 1880, p. 7) claims the limit to be 0·0014 milligramme, Poleck at 0·006 milligramme, Beckurts (Beckurts, *Jahresberichte d. Pharm.*, 1884, p. 475) at 0·002 milligramme, and Classen at 0·001 milligramme (*Analyt. Chemie*, 1901).

This test is open to serious objections, chiefly due to the extreme sensitive nature of the solution of silver nitrate. These may be summarized as follows :—

(*a*) The presence of sulfur, sulfates, phosphorus or hypophosphites in the reagents or substance to be tested, results in the generation of sulfureted or phosphoreted hydrogen, either of which will produce a black to brown spot like that of arsine.

(*b*) Presence of coal gas or traces of sulfureted hydrogen in the paper or air of the laboratory will likewise produce a dark stain on the paper cap. The same may be said of the presence of dust or the use of a poor quality of filter paper (Curtman, *Rundschau*, 1891, p. 33).

(*c*) The action of pure hydrogen gas for a longer period of time will also cause blackening of the paper cap; this is liable to happen when the reaction is caused to proceed slowly in order to avoid loss of any traces of arsenic probably present. (Flückiger, *Archiv d. Pharm.*, 27, p. 1; also Lohmann, *Pharm. Ztg.*, 1891, p. 748). Another objectionable feature must not be overlooked, and that is the rigid exclusion of the sunlight during the period of testing.

(*d*) Solutions containing antimony produce reactions similar to those of arsenic.

The Modified Gutzeit or Mercuric Chlorid Test.—The substitution of mercuric chlorid for silver nitrate was first proposed by Merçeron and Bergeret (*Comptes Rend.*, 1879, 118) in 1874. The action of arsine on mercuric chlorid had already been studied and found to consist either of the yellow compound $AsH(HgCl)_2$ produced through traces of the gas, or the orange $As(HgCl)_3$ which results from an excess of arsine. In applying this test it is the yellow compound which is ordinarily observed, since the tests are directed only for the presence of traces of arsenic. Alcohol exerts no effect upon this reaction; the test-cap should be dry when the test is applied. Antimony (Stibine SbH_3) produces a dark gray

to brownish black coloration due to the instantaneous decomposition of the compound $Sb(HgCl)_3$ into $SbCl_3$ and Hg_3 which upon moistening with water react with the production of white HgCl and SbOCl. The spot produced by both gases is brown, and if the paper containing this is cut out and immersed in a watch glass containing 80 per cent. alcohol, the antimony spot disappears, while the distinctive bright yellow arsenic spot makes its appearance (Lohman, *Pharm. Ztg.*, 1892, 36). Prolonged action of hydrogen gas results in the production of calomel. This test may be carried out with full exposure to daylight. Any sulfates or sulfites which might be present and reduced to hydrogen sulfid, may be recognized by the blackening of the lead acetate gauze. The only substance which may react similar to arsine, is phosphine (PH_3), produced through the presence of hypophosphorous acid; this is provided against by the preliminary oxidation of the chemical by nitric acid. It will also be noted (U. S. P., p. 322) that *all* chemicals are first subjected to the action of a reducing agent before introducing into the test-apparatus. This is due to the fact that the greater part of the arsenic present in chemicals is in the "*ic*" state, and that the moderate quantities of zinc and acid employed in the test are insufficient to secure complete reduction to "*ous*" arsenic. Tests made by Bird (*Chem. and Druggist*, 1900, 1073), corroborated by the writer, have shown that when 0·05 milligramme of sodium arsen*ate* was tested beside arsen*ous* acid containing the same amount of arsenic, the stain from the former, in 15 minutes, was only about one-fourth of the intensity of that from the latter. Among the various reducing agents employed, sulfurous acid[1] was found to be the least objectionable and most satisfactory. The quantity directed, is completely and readily removed by 15 minutes heating upon the water-bath.

The quantity of zinc and hydrochloric acid (8 per cent.) employed is sufficient to secure a steady evolution of hydrogen for at least half an hour, which will remove all arsenic that may be present in the solution being tested. Pure zinc, as is well known, reacts very

---

[1] Hydriodic acid answers readily with sodium phosphate, 0.5 gramme of the salt is placed in the test-flask and 20 c.c. of 8 per cent. hydrochloric acid and 1 c.c. of normal potassium iodid solution added. The mixture is heated in a boiling water-bath for five minutes, then quickly cooled to room temperature, the zinc added, etc., as usual. Five minutes heating is sufficient to effect the reduction.

slowly and unsatisfactorily with diluted sulfuric acid, hence the substitution of hydrochloric acid.

The limit of delicacy of this test may be placed at 0.002 milligramme of As_2O_3, this amount produces a faint but distinct yellow stain upon the test-cap.

Bettendorf's Test. U.S.P., p. 466.—The test as recognized in the last edition of the Pharm. Ger., consists in simply adding a concentrated solution of the chemical to be tested to a freshly prepared solution of stannous chlorid in concentrated hydrochloric acid. The employment of the tinfoil, as directed in our last revision, is not advisable, owing to its tendency to cause a reduction of other metals, producing a reaction simulating that of arsenic (Paul and Cownley, *Pharm. Jour. Trans.*, 1893, 431, and Curtman, *Pharm. Rundschau*, 1894, 15.)

To obtain a clear solution of the reagent which will remain clear and colorless on warming and respond readily to the presence of arsenic, it is absolutely necessary that the stannous chlorid be freshly prepared. Commercial stannous chlorid yields a yellow to brownish solution when warmed with hydrochloric acid.

The chief objections that have been offered to this test are:

(*a*) Fails to give evidence with less than 0·1 milligramme As_2O_3 in 1 c.c. The presence of mercury, tellurium and selenium (frequently occurring in acids), which produce reactions simulating those of arsenic. (Dawydon, *Ch. Zeitg.*, 1895, p. 70.)

(*b*) Liability of error, due to deterioration of the stannous chlorid (Geissler, *Pharm. Centh.*, 1895, p. 591.)

The advantages claimed for this reagent are its simplicity of application and adaptability to the detection of arsenic in the presence of antimony. As to delicacy of reaction, Beckurts (Beckurts, *Pharm. Centh.*, 1891, p. 570) gives 0·1 milligramme as the limit, Frerichs (Frerichs, *Apoth. Ztg.*, 1897, p. 176) claims to be able to identify $\frac{3}{4}$ milligramme of arsenous oxide in one hour's time.

Curtman places the limit at 0·1 milligramme, and states that if after one hour's time no reaction takes place, then less than $\frac{1}{100}$ per cent. of As_2O_3 may be present.

We have found that 0·02 milligramme will produce a very faint brownish tint when viewed by reflected light on a white surface. Comparison should always be made with a solution of the reagent under the same conditions. Sulfates and sulfids should be absent from the chemicals being tested.

Fleitman and F. Gatehouse Test. U.S.P., 7th Rev.—Aside from excluding antimony, these tests offer no advantages whatever over the Gutzeit mercuric chloride and Bettendorf's tests; in fact, they possess all the disadvantages of the old Gutzeit silver test.

One of the chief difficulties encountered with the Fleitman test is to secure a uniform evolution of hydrogen gas, which is so essential in the complete conversion of the arsenous oxide into arsine. The Gatehouse modification offers but little improvement.

Both Hager (Hager, *Ztschr. Analyt. Chemie*, 2–82) and Clark (Clark, *Jour. Chem. Soc.*, 1893, 884) have pointed out that this test fails if arsenic be present in the "*ic*" state. Curtman states that a scarcely distinguishable reaction takes place with 0·01 milligramme of As_2O_3.

For convenience we may summarize these tests as follows:

Berzelius–Marsh	limit	0·001	mgm.	As_2O_3
Gutzeit Silver	"	0·001	"	"
Gutzeit Mercuric Chlorid	"	0·002	"	"
Bettendorf's	"	0·1	"	"

(*To be continued.*)

STUDIES IN PLANT MUTATION.[1]

By Henry B. Slade.

It has long been recognized that the species of a given family in general have the same or similar chemical principles, that alkaloids hinder the action of enzymes in some cases and aid in others, and that the metabolism of plants, by which the protoplasm continues its activity, is a question of enzymic activity.

This suggests the thesis that changes in form in the plant are due to changes in the metabolic process, induced by the formation of principles which interfere with the normal process, the formation of the principle in turn resulting from the stimulus of a changed

[1] Professor Slade, who was connected with the University of Arizona, and who died in Tucson, Arizona, in June, 1905, left among his papers the unfinished article which we publish at this time. It was the beginning of a very interesting piece of work which, if it could have been finished, gave promise of being far-reaching in its conclusions.

Professor Slade was known to the readers of this *Journal* through his valuable paper on "Some Alkaloids of the Death Camas," published about the time of his death.—Editor.

environment. On the other hand, if the principle formed stimulates the metabolic process, the form may be preserved despite the change of environment. As an experimental test of the action of alkaloids upon the metabolic process, a study of the action of active principles upon plant diastases has been made. The method was to digest 2 c.c. of a water extract of the plant (1 : 10) with 2 c.c. of dilute starch solution and 1 c.c. of a 1 per cent. alkaloid solution (=0·2 per cent. of the mixture) for 15–60 minutes at 30°–40° C., titrating with dilute iodine solution after cooling. The amount of iodine solution needed to produce the same color as the water-control showed comparatively the amount of starch changed to sugar. The results are expressed in percentages of the water control.

Control = 100 . .	Aconitine.	Anemonol.	Morphine.	Berberine.	Strychnine.	Brucine.	Atropine.	Digitalin.	Quinine.	Veratrine.	
Ranunculaceæ:											
Anemone . .	200	66	66	—	66	—	—	66	100	—	
Delphinium .	200	50	75	—	75	—	—	150	100	—	
Fumariaceæ:											
Corydalis . . .	116	—	83	1000	—	—	—	—	—	—	
Papaveraceæ:											
Eschscholtzia	102	—	142	183	58	53	73	73	91	44	
Cruciferæ:											
Sisymbrium .	162	50	98	—	75	54	88	78	85	33	
Liliaceæ:											
Brodiaea . . .	142	—	—	1000	85	85	128	114	114	—	(flower) 16 minutes at 40°
"	1000	—	87	1000	1000	1000	87	62	1000	1000	(flower) 34 minutes at 36°
"	277	—	100	175	175	250	275	225	375	275	(leaf.)

[Anemone contains anemonol; Delphinium, delphinine, very similar to aconitine of Aconitum; Corydalis contains berberine; Eschscholtzia, chelidonine and other alkaloids, possibly morphine; glucosides, yielding oil of mustard, are characteristic of Cruciferæ, and veratrine is the characteristic alkaloid of Liliaceæ; strychnine and brucine come from Strychnos Nux-vomica; atropine from Atropa Belladonna; quinine from Cinchona.]

The preceding table gives the first series of diastase tests made. It here appears that the alkaloid characteristic of a family aids the diastatic activity of the members of that family; thus, aconitine with Ranunculaceæ, berberine with Fumariaceæ, morphine and berberine with Papaveraceæ, veratrine with Liliaceæ.

This favoring action almost appears to run parallel with the natural relation of the family; thus, aconitine and morphine with Ranunculaceæ, Fumariaceæ, and Papaveraceæ.

Alkaloids of distant families retard the diastatic action; thus, strychnine and brucine, atropine, digitalin, quinine, and veratrine. Note that veratrine, which aids with Brodiaea, hinders in the other cases. Digitalin with Delphinium in favoring the action forms an exception. With Brodiaea all the alkaloids appear to aid, an exception to the general rule.

The next table gives some tests on the diastatic activities of several scattered families under the influence of alkaloids.

	Aconitine.	Anemonol	Lupinine.	Strychnine.	Brucine.	Atropine.	Digitalin.	Morphine.	Quinine.
Leguminosæ:									
Astragalus	185	100	333	—	—	—	—	—	—
Lupinus	133	66	—	—	66	66	66	100	33
Calliandra	250	—	466	—	—	—	—	—	—
Plantaginaceæ:									
Plantago	—	—	—	0	—	100	—	—	—
Onagraceæ:									
Œnothera	—	—	—	86	86	111	—	—	—
Malvaceæ:									
Sphæralcea	1000	—	—	1000	1000	—	—	—	1000 (control 1000.)
Geraniaceæ:									
Erodium	77	—	—	100	44	—	77	—	44
Cactaceæ:									
. . . .	62	—	—	—	25	—	75	—	—
Compositæ:									
Chaenactis	—	—	—	300	—	—	—	300	500
	Five other specimens tested, but tests unsatisfactory.								
Polygonaceæ:									
Eriogonum	200	—	—	0	0	0	100	—	0

In the foregoing tests the difference in the diastatic activity with the alkaloids according to the family appears marked, an alkaloid hindering in one family, aiding in another.

Lupinine is a principle of Lupinus. Its favoring action in Leguminosæ appears marked, increasing the diastatic activity three and fourfold.

Here, as in the first series, families which vary appear to be hindered in their diastase action by the alkaloids. Note Cruciferæ, Ranunculaceæ, Papaveraceæ, while Brodiaea, which is not apparently variable, is favored by the alkaloids. Sphæralcea is variable but forms an exception here in being favored by the alkaloids. The

composites with their highly developed stable forms are favored, while the species of Cactus is hindered.

The favoring action of aconitine in almost every case, except with Erodium and the Cactus, also appears.

The next series of tests with related groups were with the families included by Engler and Prantl in the Tubuliflorae.

	Strychnine.	Brucine.	Atropine.	Digitalin.	Quinine.	Morphine.	Aconitine.	
Hydrophyllaceæ:								
Phacelia (1)	0	0	0	—	—	—	—	
" (2)	1000	1000	—	1000	1000	—		(control 1000.)
" (3)	1000	106	—	—	—	—		" "
" (4)	1000	1000	—	1000	1000			" "
Polemoniaceæ:								
Gilia (1)	1000	1000	—	—	1000	1000		(control 1000.)
" (2)	1000	1000	—	—	1000	1000		" "
" (3)	1000	1000	—	—	1000	1000		" "
Labiatæ:								
Salvia	1000	100	0	100	100	—	100	
Solanaceæ:								
Quincula	120	113	26	—	—	—		
Scrophulariaceæ:								
Pentstemon	25	25	75	175	50	100	275	
Verbenaceæ:								
Verbena	1000	1000	1000	75	125	—	1000	
Borraginaceæ:								
Amsinckia	1000	1000	100	100	166	—	1000	
Cryptanthe	1000	1000	100	100	1000	—	1000	

With Gilia and Phacelia, in the seven species tried, the activity of the extracts makes any comparison of the effect of the alkaloids impossible.

With the others of this group the favoring action of strychnine and, in a less degree, of brucine is marked.

The hindering action of atropine, an alkaloid of the Solanaceæ, with Quincula forms the only exception to the rule that the alkaloid of a family favors the diastase action of the species of that family, and Quincula is exceedingly variable.

Atropine aids with Verbena and inhibits with the closely related Salvia, while with the Borages it is indifferent.

The 31 species tested, representing 24 genera and 20 families, show conclusively that the action of alkaloids with the diastase varies according to the alkaloid and the family. The tests, fragmentary and

representing a single trial in most cases, indicate that the action of the alkaloid favors a constant form and hinders a variable form, and that in general the principle of a family aids the diastatic action of species of that family.

On the basis of the preceding results germination tests were started with the thought that strychnine in aiding the diastatic activity of Solanaceæ also stimulates the germination of the seeds of that family.

Schizanthus, 100 seeds. After 38 hrs.		48 hrs.	64 hrs.	81 hrs.	109 hrs.	128 hrs.
Water control . . .	18	26	38	47	58	
Brucine, 0·2% . . .	3	5	7	14	16	
Strychnine, 0·2% . .	23	19	35	57	65	
Scopolamine, 0·1% .	7	9	16	23	23	
Atropine, 0·2% . . .	1	6	13	26	33	
Hyoscyamine, 0·1%	5	?	6	8	8	11

Strychnine appears to slightly better advantage than water control.

Tomato, 100 seeds.	38 hrs.	48 hrs.	64 hrs.	81 hrs.	104 hrs.	128 hrs.
Water control . . .	0	3	45	74	87	
Brucine	0	0	4	38	80	
Strychnine	0	40	77	85	90	
Scopolamine	0	5	46	70	85	
Atropine	0	0	34	89	87	
Hyoscyamine . . .	0	3	16	53	53	89

Stimulating effect of strychnine clearly evident.

Egg-plant, 100 seeds.	38 hrs.	48 hrs.	64 hrs.	81 hrs.	109 hrs.
Water control . . .	0	0	0	0	discarded
Brucine	0	0	0	3	10
Strychnine	0	0	1	19	37
Scopolamine	0	0	0	0	discarded
Atropine	0	0	0	13	24
Hyoscyamine . . .	0	0	2	4	13

Mould in every case, but effect of strychnine still apparent.

Red pepper, 100 seeds.—Germinations after 109 hours.	109 hrs.	128 hrs.
Water control	0	0
Brucine	0	0
Strychnine	0	0
Scopolamine	7	7
Atropine	4	4
Hyoscyamine	8	8

Scopolamine, hyoscyamine, and atropine are all alkaloids of Atropa Belladonna. Hyoscyamine and scopolamine aid; atropine in less degree.

Ipomœa, 26 seeds.	After 38 hrs.	48 hrs.	64 hrs.	81 hrs.	109 hrs.
Water control	0	0	0	1	2
Brucine	0	0	0	0	0
Strychnine	0	1	2	2	2
Scopolamine	0	0	1	1	5
Atropine	0	0	0	0	1

Scopolamine aids most—20 per cent. of total as against 8 per cent. with control.

Petunia, 100 seeds.	After 38 hrs.	48 hrs.	64 hrs.	81 hrs.	109 hrs.
Water control	0	0	0	2	12
Brucine	0	0	0	8	23
Strychnine	0	0	2	5	11
Scopolamine	0	0	3	11	15
Atropine	0	0	7	17	27
Hyoscyamine	0	0	0	1	8

Atropine favors germination; brucine almost as much.

Digitalis.—Only one of five species of Scrophulariaceæ tested to germinate.

	After 109 hours.
Water control	42
Brucine	5
Strychnine	60
Scopolamine	0
Atropine	7
Hyoscyamine	0

Cobæa scandens—only 3 seeds in each test and not sufficient for conclusions.

Brucine 2, strychnine 2, and atropine 1, have germinated before water control.

Verbena, 50 seeds.—Water control discarded on account of mould after 81 hours. All were more or less mouldy. The results were as follows, when control was discarded:

	After 64 hrs.	81 hrs.	109 hrs.
Water control	0	0	discarded
Brucine	0	0	0
Strychnine	0	1	5
Scopolamine	0	0	8
Atropine	0	2	7
Hyoscyamine	0	0	4

SUMMARY.

Aided by strychnine	Schizanthus, Tomato, Egg plant, Digitalis.
Brucine	Petunia.
Atropine	Petunia, Ipomœa.
Hyoscyamine	Red pepper,
Scopolamine	Ipomœa.

A specific favoring action of alkaloids for each species is indicated.

The results with strychnine in general accord with the diastase tests.

ADDENDUM.

Several species have been tested as to the action of alkaloids upon the oxidase. The intensity of the blue color with guaiac with the same dilution showed whether the alkaloid hindered, aided, or was indifferent. In general the alkaloids which favored the diastatic action hindered the oxidase.

Brucine appeared especially injurious to the action of the oxidase, and strychnine almost equally so in the very species where the alkaloids favored the action of the diastase. On the contrary, principles injuring the diastatic action, as anemonol, aided the oxidase action. In a number of species examined oxidases appeared very active in Gilia, Quincula, Sphæralcea, and other variable species, as certain Cacti, while Anemone, Delphinium, and species containing active principles gave little or no oxidase reaction. Alkaloids aid oxidation and it is possible that in plants lacking in oxidases the alkaloid renders more efficient the oxydizing capacity of the vegetable cell.

LONDON BOTANIC GARDENS.

By Pierre Élie Félix Perrédès, B.Sc., F.L.S.,
Pharmaceutical Chemist.

A Contribution from the Wellcome Research Laboratories, London.

(*Continued from p. 280.*)

The description of the present collections will be dealt with in the next section, but before passing on to this we will consider very briefly some of the more noteworthy publications which have been mentioned in the preceding pages. The majority of these, as one would expect, were expressly designed for the use of students. The following, for instance, are all embraced in that category: Dale's *Pharmacologia*, Joseph Miller's *Botanicum Officinale*, the catalogues of Philip Miller and Isaac Rand, Philip Miller's "Short Introduction to the Knowledge of the Science of Botany," Curtis's "Linnæus's System of Botany" and his "Lectures on Botany," J. L. Wheeler's catalogue, and Lindley's *Flora Medica*. But Philip Miller's "Gar-

deners Dictionary," Hudson's *Flora Anglica*, and Curtis's *Flora Londinensis* take rank among the classics of English botany, while the last named author's "Botanical Magazine" and Lindley and Moore's "Treasury of Botany" are standard works of reference to this day. These by no means exhaust the list of publications issued by workers who were, at one time or the other, connected with the Chelsea Garden—the list of Lindley's published works, for instance, occupies twelve pages of the folio catalogue of the Library of the British Museum—but they are the most germane to our subject, and comprise all that we shall be able to consider here.

Dale's *Pharmacologia*, or to give it its full title, *Samuelis Dalei Pharmacologia, seu manuductio ad Materiam Medicam: in qua Medicamenta Officinalia Simplicia, hoc est Mineralia, Vegetabilia, Animalia eorumque partes in Medicinæ Officinis usitata, in Methodum naturalem digesta succincte & accurate describuntur*, was first published in 1693 in a duodecimo volume, and went through several editions "both in this country and in foreign parts." The *Tertia Editio* (fourth British issue) appeared in quarto in 1737. Dale's work is written in Latin, but an English name is appended to each substance, and an *Index Anglo-latinus in quo Nomina Anglica Latinis præponuntur, ordine alphabetico*, is added at the end of the book "*in gratiam Tyronum;*" in the *Liber Secundus*, "*De Plantis Medicamentosis*," Ray's system is used *in toto*.[1] The great merit of the *Pharmacologia* lies in the

---

[1] Semple states, in his revision of Field's "Memoirs" (p. 65), that the system of Tournefort is adopted in the third edition of Dale's *Pharmacologia*, but this statement is without foundation. Pulteney quite correctly says that "the arrangement of the work is that of Ray," and Dale himself, in the preface to his work, specifies his reasons for following this course in the following words:

"Præter Objectiones contra hunc nostrum Laborem, quæ supra in hac Præfatione refelluntur, restant & aliæ quædam, quibus obviam ire hoc in loco necesse duxi. . . . Deindè, me stirpes ad *Raianam Methodum*, quæ à paucis intelligitur, disposuisse dicunt. Cum verò brevitati semper consului, satiùs duxi methodum talem instituere, qua singulas ejusdem herbæ partes simul tractare possem, neque eadem sæpius repeterem, ut necesse esset, si veterem Radicum, Corticum, Herbarum, Seminum, &c., methodum, vel vires medicas secutus essem, uti ab aliis factum est. Hoc quidem caveri potuisset, si ordine Elementari omnia distribuissem; tunc verò Vegetabilia, aliaque congenera separata fuissent, quæ legibus Physicis uniuntur; & Lectori Philosophico, tanquam memoriæ ancilla, aptius hæ accommodantur leges: Et ut verum fatear, inter varias recentes Plantarum methodos intra paucos annos editas, *Raianam*, ut naturæ magis consentaneam, cæteris semper anteposui." *Præfatio*, p. vii.

fact that it is free from the astrological and other absurdities which were rife in publications of a similar nature at that date, and it can therefore be looked upon as the first rational British text-book of materia medica that we possess. Ray, it is true, had paved the way in his writings by casting ridicule upon these old superstitions;[1] but the scope of Ray's works differed essentially from that of the *Pharmacologia*, for whereas Ray treats of plants in general, and only refers in a casual way to the properties of such plants as are used in medicine, Dale, in the *Liber Secundus* of his work deals particularly with medicinal plants and their products. The copious and accurate synonymy and the conciseness of Dale's *Pharmacologia* will best be demonstrated by quoting a portion of one of his monographs, and, for this purpose, we will select the first part of the monograph on gentian, relating to the plant which yields the gentian root of the pharmacopœias:

III. *DE GENTIANA.*

Notae sunt, Folia nervosa, in caulibus ex adverso bina; flores calathoides, margine in lacinias aliquot totidem folia imitantes plerumque diviso; sapor amarus, Raii Synop. p. 102.

A. 1. Gentiana, *Offic. Chab.* 503. Gentiana major, *Ger.* 351. *Emac.* 432. *Raii. Hist.* i. 716. Gentiana major lutea, *C. B. Pin.* 187. *Tourn. Inst.* 80. *Elem. Bot.* 96. *Boerh. Ind.* A. 204. *Hist. Oxon.* iii. 484. *Park. Parad.* 350. Gentiana vulgaris major. Ellebori albi folio, *J. B.* iii. 520. **Gentian.** In hortis curiosorum. Junio floret. *Usu.* Radix oblonga, crassa, foris fusca, intus ex flavo rufescens, saporis intensè amari. *Vires.* Alexipharmaca est; aperit, attenuat. Usus præcipui in peste, aliisque venenatis affectibus; in obstructione hepatis, lienis, &c. *Schrod.*

The reader has only to compare this abstract with the interminable descriptions of Parkinson[2] or the verbiage of William Coles to appreciate the great advance that it represents.

Just as Dale's *Pharmacologia* may be looked upon as our first rational text-book of Materia Medica, so may Joseph Miller's

---

[1] Take, for instance, the following remarks by Ray in his *Historia Plantarum*, Tom. I, p. 46: "Signaturas præcipuè crepant Chymistæ. Chymicum autem dudum definivit Davisonus ut memini (quàm rectè ipse viderit) *Animal credulum & mendax.*

"Nos alibi Signaturas rejecimus, nec ullas notas naturæ consilio plantis impressas ut naturalium facultatum indices essent, demonstravimus, nec dum sententiam mutamus, ob rationes ibi adductas, quas hic repetemus."

[His reasons are then given, under seven heads.]

[2] The virtues of Gentian as described by Parkinson would fill over two pages of the AMERICAN JOURNAL OF PHARMACY.

"*Botanicum Officinale;* or a Compendious Herbal giving An Account of all such Plants as are now used in the Practice of Physick. With their Descriptions and Virtues" (London, 1722), be regarded as the first text-book of vegetable Materia Medica, worthy of the name, in the English language. Although Joseph Miller's *Botanicum Officinale* is a smaller work than Dale's, it is better adapted to the needs of the beginner, for it is written in English, and in place of Dale's copious synonymy, which is more particularly of value to the advanced student, the author has given longer description of the plants, which he hopes, "*will not be thought too particular, or unnecessary, since they are written with a Design to render this Treatise as informing as possible; and in Order to it,*" he has "*not only consulted Authors of the greatest Name in* Botany," but has "*had Recourse to most of the Simples themselves in their natural Productions. All the Materials are disposed in alphabetical Order, and under the same Names they bear in the* Catalogue of Simples *in the last Edition of the* College Dispensatory, *together with those given them by* Caspar Bauhin, Gerard, *and* Parkinson, *Authors easiest to be met with.*" The following abstract from the *Botanicum Officinale* will show more clearly than any description would do, the difference between the two works:—

Gentiana, Gentian, *Off.* —— *major*, great Felwort, *Ger.* —— *major lutea*, great Gentian, or Felwort, *C. B. Park.*

The Root of the Great Gentian is large, thick, and woody, pretty much divided, of a yellow brown Colour, and a very Bitter Taste; the lower Leaves are pretty long and broad, somewhat roundish, but pointed at the Ends, stiff, and pretty much of the Shape of the Leaves of white Hellebore [compare Plates XIX and XX,[1]], but of a yellow green Colour, with five large Veins on the Back of each. The Stalk arises to be a Yard or more high, having two smaller and shorter Leaves growing opposite at each Joint, which are at some Distance. Among these, on the upper Part of the Stalk, the Flowers grow *verticillatim*, or are set round it; they are monopetalous, or of one Leaf divided almost to the Bottom, into five Segments laid open like a Star, with a green *Umbo* in the Middle, beset with yellow *Stamina* and *Apices*. The Seed is small and brown, growing in longish round Seed-Vessels. It grows wild in the *Alps*, and in several Mountainous Parts of *Germany;* flowering in *July*. The Roots are used.

The virtues are described by Joseph Miller in inverted commas, and, according to Pulteney,[2] they were taken from [one of the earlier

[1] The plant represented on Plate XX is *Veratrum viride*, and not *Veratrum album*, but it will serve just as well.

[2] *Loc. cit.*, Vol. II, p. 103.

editions of] the *Pharmacologia*, but they are inferior to those of the third edition of that work. In the present instance, for example, "Gentian Roots" are described as "hot and dry," but this Aristotelian taint is the only relic left of medieval superstition, and the remainder of the description, which seems to have been originally condensed from Parkinson, is similar to that given by Dale.

The monograph ends with the statement that the "Officinal Preparations are a *Compound Water* and an *Extract*"—information obviously useful to the Apothecary's apprentice.

We have dealt at some length with these two books, as they are of especial interest to the pharmacist, but the remainder of the works on our list must be considered as briefly as possible.

There is little to add to what has already been said on the subject of Philip Miller's and Isaac Rand's catalogues, save that Rand's Index of 1739 is written entirely in Latin, that the arrangement is alphabetical, and that "Ray and Tournefort are the principal authorities referred to."

The scope of J. L. Wheeler's catalogue will be made apparent by the following abstract:—

CLASSIS V.

ORDO II.

PENTANDRIA DIGYNIA.

* *Flores Monopetali inferi.*

GENTIANA. Willd. Spec. Plant. i. 1331. Persoon Syn. i. 284.

ORDO NAT. ROTACEÆ. Linn.

CLASSIS VIII. ORDO XIII. GENTIANÆ. Capsula simplex unilocularis. Juss.

CHAR. GEN. Corolla monopetala. Capsula bivalvis, unilocularis. Receptaculis duobus, longitudinalibus.

* Corollis 5–9 fidis subcampanulatis.

47. GENTIANA LUTEA.

CHAR. SPEC. Foliis latis ovatis nervosis, corollis subquinquefidis rotatis verticillatis. Calycibus spathaceis.

ANGLICE, Gentian.

LOCUS. In alpibus et subalpinis pratis. Perennis.

VIS. Amarissima. Tonica præstans, parum nauseosa.

USUS. In Dyspepsiâ.

COMP. Ext. Gentianæ. *Lond. Edin. Eblan.*[1] Inf. Gent. Comp. *Lond. Edin. Eblan.* Tinct. Gent. Comp. *Lond. Edin. Eblan.* Vinum Gent. Comp. *Edin.*

---

[1] These refer to the preparations official in the Pharmacopœias of London, Edinburgh, and Dublin respectively, now merged into one: the British Pharmacopœia.

Of Philip Miller's "Short Introduction" to Botany nothing further need be said, but a few words must be spared for Curtis's "Linnæus's System of Botany" and his "Lectures on Botany." Both of these were published after the author had severed his connection with the Chelsea Physic Garden in order to found a school of his own in his garden at Lambeth, and they are chiefly remarkable for the beautifully executed and accurate engravings which they contain. These are printed from copper plates, and are designed to illustrate the terms used in Botany and the divisions of the Linnean System, by means of representations of the living plants.

Lindley's "Flora Medica; a botanical account of all the more important Plants used in Medicine, in different parts of the World" (London, 1838) is a modern text-book in every sense of the word, and it could very advantageously do duty at the present day, with but little alteration. The generic and specific characters are very fully, albeit concisely, given, and the medicinal uses of the plants are admirably summarized. Indeed, in looking through the book one is struck by the fact that the additions which have been made since then to our knowledge of the subject are relatively unimportant. We have, it is true, located the active constituents of many plants, but Lindley does not deal with plant analysis, and the therapeutical properties of the drugs which we use were known in 1838, although their active principles may not have been isolated nor the mechanism of their action on living tissues determined. The *Flora Medica*, however, did not appeal to the class for which it was intended. This was probably due to the fact that there was too much botany in it for the average medical student, while, on the other hand, the botanist capable of appreciating Lindley's work would naturally prefer to consult more comprehensive works on Systematic Botany. But Lindley's labors were not entirely in vain, for the information which he had so laboriously compiled on the medicinal uses of plants was utilized by the medical botanists who contributed to the "Treasury of Botany."

"The Gardeners Dictionary" by Philip Miller was first published in 1724. The first edition in folio appeared in 1731, and the last edition, in four folio half-volumes, was issued in 1807 under the editorship of Thomas Martyn, the then Regius Professor of Botany in the University of Cambridge. Martyn's preface contains a detailed account of all the various editions of Miller's *magnum opus*, and to

this we must refer the reader who is interested in the subject. For nearly a century the "Gardeners Dictionary" was the recognized authority on gardening in this country, and we find Linné saying of it: "*Non erit Lexicon Hortulanorum, sed etiam Botanicorum.*" Miller's work is, therefore, of considerable historical interest at the present day, inasmuch as its several editions reflect the progress of gardening in this country during the period in which they were published. It is of interest to record that in the eighth edition, published in 1768, Miller suggests that certain useful plants "as namely the Safflower, Indigo, and several other sorts used in dyeing, none of which will thrive in this country to advantage, with many medicinal drugs" should be cultivated in the West Indian Possessions. From the account which has already been given of the work of Kew Gardens it will have been noticed that the suggestion put forward by Philip Miller in 1768 was partly acted upon subsequently (see AMERICAN JOURNAL OF PHARMACY, Vol. 78, pp. 73–74). In 1732 Philip Miller published his "Gardeners Kalendar." This little book, which may be looked upon as a supplement to the "Gardeners Dictionary," went through fifteen editions in the author's lifetime, and its principal interest to us lies in the fact that "A List of the Medicinal Plants which may be gather'd in each Month for Use" is added to the ninth edition—a circumstance which would lead us to suppose that the apothecary, in Miller's day, cultivated his own drugs, or, at all events, gathered those which were indigenous.

Hudson's *Flora Anglica* has already been referred to at some length, and it is only necessary to add that it was for many years the standard guide to the flora of this country. The first edition was published in 1768 in one volume, and the second in 1778, in two volumes.

William Curtis's *Flora Londinensis* and "The Botanical Magazine" may be taken together. The beauty and accuracy of the plates, which are reproduced in every case from the living plants, constitute the dominant feature of these two works, as of all Curtis's publications. The *Flora Londinensis* was commenced in 1777, but only six fasciculi were issued, as the subscriptions did not cover expenses. Each fasciculus contains the plates and descriptions of 72 plants growing "wild in the Environs of London," printed on large folio sheets. In the "English Botany" by Sowerby and Smith, which appeared subsequently, the task which Curtis had begun in his

Flora Londinensis was, to some extent, completed, and even extended, but the plates of the former work are not to be compared with those of Curtis's six fasciculi. The first number of "The Botanical Magazine; or Flower-Garden Displayed" was issued in 1787, and the plan of the work, which has been faithfully adhered to in its essentials ever since, is outlined by Curtis in his preface as follows:—

> "The present periodical publication owes its commencement to the repeated solicitations of several Ladies and Gentlemen, Subscribers to the Author's BOTANIC GARDEN, who were frequently lamenting the want of a work, which might enable them, not only to acquire a systematic knowledge of the Foreign Plants growing in their gardens, but which might at the same time afford them the best information respecting their culture—in fact, a work, in which Botany and Gardening (so far as relates to the culture of ornamental Plants) or the labour of LINNÆUS and MILLER, might happily be combined.
>
> "In compliance with their wishes, he has endeavoured to present them with the united information of both authors, and to illustrate each by a set of new figures drawn always from the living plant, and coloured as near to nature as the imperfection of colouring will admit.
>
> "He does not mean, however, to confine himself solely to the Plants contained in the highly esteemed works of those luminaries of Botany and Gardening, but shall occasionally introduce new ones, as they may flower in his own garden, or those of the curious in any part of Great-Britain."

After Curtis's death the "Botanical Magazine" was continued by John Sims, who was succeeded by Sir William Hooker, to be followed in turn by Sir Joseph Hooker, and by the present editor, Sir William Dyer. The value of the "Botanical Magazine" to the pharmacist is evidenced by the fact that, in the last edition of the British Pharmacopœia, he is referred to that magazine for plates of the following plants: *Aloe Chinensis*, Baker (*Bot. Mag.*, plate 6301); *Aloe Perryi*, Baker (*Bot. Mag.*, plate 6596); *Erythroxylon Coca*, Lam. (*Bot. Mag.*, plate 7334); *Hamamelis Virginiana*, L. (*Bot. Mag.*, plate 6684); *Illicium verum*, Hook. f. (*Bot. Mag.*, plate 7005); *Pilocarpus Jaborandi*, Holmes (*Bot. Mag.*, plate 7483); *Quillaja saponaria*, Molina (*Bot. Mag.*, plate 7568); and *Smilax ornata*, Hook. f. (*Bot. Mag.*, tab. 7054).

"The Treasury of Botany," edited by Lindley & Moore, is last on our list, but not least. It would be a work of supererogation to describe a book which is so well known to every economic botanist, but it is no exaggeration to say that there is no other work on the same subject which contains so much information compressed into so small a space.

With the "Treasury of Botany" we may fitly close our account of the work accomplished in the Chelsea Physic Garden under the ægis of the Society of Apothecaries. On contemplating these splendid achievements we cannot but experience a feeling of regret that the institution which had been fostered by the Apothecaries for so long a period, at such great sacrifice, should eventually have fallen into decay. It was, however, in the nature of things that this should have resulted, for botanical studies have now been practically divorced from the medical curriculum, and the duties of the Apothecary have been relegated to his successor, the pharmacist.

(*To be concluded.*)

THE FUNCTION OF THE TRUE PHARMACIST.[1]

By Solomon Solis Cohen, M.D.
Professor of Clinical Medicine in the Jefferson Medical College.

Let me congratulate the members of the Philadelphia Branch of the American Pharmaceutical Association on the important step they are taking to restore the practice of pharmacy in Philadelphia to its elder and more fitting status among the learned professions. It seems to me time that a larger and nobler meaning be given to the term "pharmacist." The true pharmacist has a high function to fulfil—a much higher function than drawing soda water or handing out "proprietaries" over the counter. When the physician ceased to collect and prepare the drugs that he administered and turned over to the apothecary that important duty, in order to devote more time to his own special studies of diagnosis, pathology and therapeutics, the apothecary became charged with all the responsibilities concerning medicaments that had theretofore rested upon the physician. In the evolution of science and of art the responsibilities both of physician and of pharmacist have become greater, not less. The individual pharmacist can no more shift these duties upon the wholesaler's or manufacturer's shoulders than I can shift my responsibilities to my individual patient upon the shoulders of Jefferson College, or the County Medical Society, or a medical syndicate organized for commercial purposes. The grocer

---

[1] Address delivered before the Philadelphia Branch of the American Pharmaceutical Association, March 28, 1906.

or the notion dealer, or the six-dollar clerk in the department store, has sufficient knowledge to take a package from the shelf and hand it to a purchaser, or even to decant a portion of it into another container. To do this requires merely the ability to read a label—or perhaps only to recognize a picture. As a physician I look to my brothers of the pharmaceutical profession for greater knowledge, greater skill and greater assistance than I can get from the grocer's clerk or the errand boy. I am in the habit of consulting with friends in your profession—and I see here some of those who have thus aided me—concerning new drugs introduced from time to time, new uses and new preparations of old drugs, the possiblities of new combinations of drugs, that may have been suggested by the exigencies of a special case, as well as incompatibilities, methods of administration, and other matters in which the physician must in greater or less degree depend upon the special knowledge, training and skill of the pharmacist. In return, I have been complimented by their inquiries on matters concerning which I may have had special information of use to them. There is no reason why this pleasant relation of confidence and mutual assistance should not exist between all physicians and all pharmacists worthy of the name.

Certainly nothing will do more to extend it and to advance the best interests of the profession of pharmacy than the formation of such an association as you are now about to form in Philadelphia, and the determination on the part of practising pharmacists to maintain a high professional level as scientific men and to resist the conversion of their professional standards into trade standards. I do not intend hereby to cast any slur on trade or tradesmen; I honor both and admit the indebtedness of mankind to both; but it is a fact that standards differ. The standard of the fiction-writer is not, or ought not to be, the standard of the medical author and the standard of trade, "buy cheap and sell dear," is not and ought not to be the standard of the practising apothecary. And here I may touch upon a personal and practical matter concerning the ability of the physician to know the pharmacist as distinguished from the drug-and-soap-seller. It is impossible for every physician to know every pharmacist or even to know who is in charge of the prescription desk at a certain drug store. Frequently I am asked "Shall we take this prescription to so-and-so at the corner or shall we take it down-

town?"—or up-town, as the case may be. Now if I can have a list of members of the local branch of the American Pharmaceutical Association, and so-and-so's name appears there, I can be reasonably sure that prescription and patient will be safe in his hands; that, for example, when I prescribe infusion of digitalis he will not thwart my purpose by dispensing a dilution of a fluidextract bought from some wholesaler, but will give a real infusion made from the best leaf obtainable; that when I prescribe an imported crystalline strontium bromide, he will neither fraudulently dispense an impure domestic salt which will make my patient vomit, nor stupidly substitute fluidounces of an imported solution for the solid ounces ordered of imported salt. I am citing only a few of many such instances that have actually happened when my prescriptions have been taken to patent-medicine and perfumery stores masquerading as pharmacies; and you will admit that these instances justify me in the direction to take such a prescription to some definite drug store where I know scientific pharmacy is practised. I prefer that this should be near the patient's home if possible, but sometimes I do not know any such pharmacy in the desired neighborhood. Now the list of your members will help me in this very much, I think, as it will be, so to speak, an "Index of Dependable Druggists."

Do you realize, gentlemen, how much the progress of practical therapeutics lies in your hands? If, because of an impure or imperfect preparation, a drug that I have chosen after considerable thought as the one best adapted to the particular conditions of a special case, fails to give relief, not only the individual patient suffers, but also my professional judgment is misled as to the practical effect of the remedy; and every other patient that comes under my care is to that extent deprived of a possible agency of relief. I am misled also as a teacher and as an author. It is for this reason that when such disappointments happen in cases in which I am reasonably sure of my ground, I say, "Well, here's another prescription; take it to so-and-so." I don't say that the first druggist is at fault; I don't know that. But I determine to give my patient and my science the benefit of the doubt rather than abandon what seems to be the best line of treatment. In chronic cases we can often thus protect ourselves. But how about acute cases, or how about sudden emergencies in chronic cases of heart disease, in which the effect of musk, for instance, may, as I have repeatedly

seen, snatch a patient out of the jaws of death, and in which the dirt commonly dispensed for musk is worse than useless?

A tremendous responsibility rests on the conscientious pharmacist. He is always the active assistant of the physician; he is frequently the path-finder and guide of medical progress in certain directions. Therapeutics, so far as it relates to drugs, must advance in the future through the active and intelligent co-operation of chemistry and biology, of pharmacy and medicine. In such advance I look to this Society confidently for leading and for light.

REMARKS AT THE ORGANIZATION MEETING OF THE PHILADELPHIA BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

By Dr. Henry Beates, Jr.

Being honored with an invitation to be present this evening and listening to the remarks indulged during organization, I made brief notes of a few thoughts that perhaps can be advantageously considered; and the first point desired to be emphasized is that *the very existence of the science and art of pharmacy is determined by the successful practice of medicine*, and the successful practice of medicine depends upon a higher degree of qualification than has ever obtained in the past.

Thus the principal problem confronting the two professions is the same for each, to wit.: the establishment of conditions which *must* result in foundationing a higher standard of qualification. This embodies two conditions, applicable alike to our professions, which have unavoidably and prominently forced themselves upon our attention; and the first is the recognized necessity for the eradication of degenerate commercialism; and the second, the establishment of those conditions which will assure to both the highest standard of qualification.

In medicine, commercial degeneracy manifested itself by prostitution of the degree, and took shape in the morally rotten and unprincipled commercial medical college, which is the undeniable source of that large percentage of illiterate and incompetent practitioners of medicine, and a great public menace of the day, and, in pharmacy, a like prostitution of the output of remedial agencies, by processes which are suicidal to both the science and art of pharmacy and of medicine.

Thus we both, practically, confront one proposition—the extermination of commercialism in its bad sense, because it constitutes the one prominent factor and power which seriously obstructs progress, and postpones the fulfilment of the highest achievements possible to our professions.

It is this concrete fact, viewed from the practical standpoint, which finds this body organizing to-night, and which constitutes a nucleus composed of men of character and integrity, disinterestedly interested in the welfare of man and formed for the purpose which this honorable body has so well expressed. As the huge problem to be solved is contemplated, it may, perhaps, seem almost hopeless, but rest assured, gentlemen, that the time is most opportune for initiatory action in the direction assumed this night to be successfully launched.

The public mind, as the people are being educated, is becoming keenly alive to the importance *to them* of the questions involved! The medical profession is surely emerging from its commercial rottenness, and physicians, competent to fulfil their responsible trusts, are at last being trained, who, in the very near future, will be able to properly formulate and write a prescription, and intelligently and skilfully employ remedial agencies and all necessary means in the treatment of disease. They will also be capable of knowing, as a large percentage now in practice, and because of the above indicated reason, unfortunately do not, whether pharmaceutists correctly compound the medicaments for which a prescription calls, and also whether the patients are taking them.

It is the inability of the profession to recognize these latter points that affords the tempting ground for the unprincipled pharmacist to foist upon the prescribing physician and his patient any and everything, no matter how inert, as well as to substitute, without fear of detection, cheaper and worthless medicaments for those prescribed.

This condition of things, in the future, gentlemen, can no longer obtain! Patent medicines, nostrums, etc., from the higher and intellectual plane briefly outlined, will, by the practitioners soon to be, naturally be discarded. Law will punish the hitherto unbridled fraud and swindle, and, if the commendable initiatory action of this evening flourishes, as it must if properly cultivated, the dealer and seller of these concoctions will be regarded, by the laity as well as the profession, as a living disgrace and menace to the public good.

The members of the two professions we represent who are not in

touch with the progress being made in the work of establishing higher standards of qualification may, perhaps, be surprised to know that the time is not very far distant when it will be possible, because of enlightened public sentiment, to bring to justice those who, directly or indirectly, are identified with the conditions outlined, and who, up to the present, have followed their unprincipled methods with apparent immunity from penalty.

That this condition obtains can, perhaps, be impressed upon you by quoting the official opinion of the Attorney-General of Pennsylvania, to whom I referred a question relating to these matters for his reply. Tersely the opinion resulting from the practices of corporations and from physicians who employ those not licensed to practice medicine, and also from the action of those commercial concerns that foist upon the community products alleged to be a cure for this or that affection, evolved the question whether or not these things (advertising and selling alleged cures for this or that disease) could be done without becoming amenable to the law? This elicited the following reply; after citing the Acts of Assembly governing the practice right: "I am of the opinion that no one, whether acting for himself or under employment by corporation, can practice medicine without a full compliance with all of the requirements laid down by the Acts of Assembly above referred to." These Acts contain penalties for violation of their provisions, which are styled misdemeanor, and upon conviction thereof in the Court of Common Sessions in the proper county an exemplary fine can be imposed. The case put by you differs in no respect from the ordinary cases of practicing medicine without a license.

These advertisements practically profess to cure this or that ill with such and such a concoction. They, therefore, that is the manufacturers themselves, by alleging cures, are undoubtedly acting in the capacity of a physician, *because they offer their services as a physician to cure and care for various diseases, deformities and injuries!* A person who undertakes to do the work of a doctor, which is the treatment of all diseases, does not evade responsibility by any commercial trick or method.

By organizing to-night and establishing an educational centre of such moral force, the object of which is to educate your patrons so that they will be disposed to relinquish the intention of purchasing nostrums and alleged cures, and intelligently pursuing the wiser

course of consulting and profiting by the scientific achievement and skill of properly trained physicians, you will undoubtedly from the narrow point of view only of the money interests involved, found a far more profitable vocation because the narrow margin of profit realized by the sale of this or that concoction will be more than overbalanced, as it properly should be, by the merited remuneration of knowledge and skill; the art, I wish to designate it, of the higher qualified and learned practitioner of each of our professions.

The art of applying means to an end is a factor in practice not appreciated by either the laity or the profession. The use of means to an end is comparable, let me illustrate, by the following crude example: Suppose four of us were sitting about a table, and one challenged the others to balance on the end of his finger a small stick. The means are the same for the four. One, in his endeavor to balance the stick, is lacking greatly in skill, and with much physical effort in his attempt to balance it fails, the stick falling to the table in spite of crude efforts. Another succeeds by the trained and skillful use of the muscles of co-ordination, and quietly maintains the stick in position, as though it were fastened to his finger.

So it is with the art of the practitioner of medicine, and, in a large degree with the practitioner of pharmacy, and it is this ability to successfully do which is to constitute the future basis for legitimate and well-merited compensation; and it is when conditions upon which such skill depends are established, that those acquiring this high standard of achievement will have served the public interests, as well as their own, in the highest possible manner. A conscientious duty will have been well done, and, so far as the duties of our two professions are concerned as factors in the affairs of life, human progress will continue apace.

I congratulate you upon this commendable movement, which must of necessity establish still more firmly that indissoluble bond of union which is natural to the two professions we have the honor and the responsible trust to represent, and by the faithful, sincere and conscientious observance of the great duties reposed, the privilege of exercising the highest possible functions vouchsafed to man, will largely contribute to unparalleled success in its broadest sense.

ELIXIR AROMATICUM.

By William G. Toplis.

The formula for the preparation of Elixir Aromaticum is one of the greatest time-consumers in the United States Pharmacopœia. The continued filtration and refiltration of the product, particularly where considerable quantities are made, requires the prolonged presence of material and apparatus upon the working table, often using space needed for other purposes. This needless sacrifice of time prompted me to seek a short cut in the preparation that would make no sacrifice of its properties, yet expedite its manufacture. As a result of thought and experiment on the subject I submit the following for your consideration:

Take of

Purified talcum	30 grams.
Comp. sp. orange	12 c.c.
Alcohol	238 c.c.
Distilled water	563 c.c.
Sugar	375 grams.

Mix the comp. sp. of orange with the purified talcum (personally I prefer magnesium carbonate). To this, in a mortar, add gradually the water and alcohol previously mixed after the manner of making medicated waters, transfer to a wetted filter and when the filtrate has passed make it up with distilled water through the filter to measure 818 c.c., then add the sugar and dissolve by agitation, or the sugar may be percolated with the filtrate if preferred. This method makes a clear bright preparation and it may be finished in about 15 minutes up to the addition of the sugar.

PASTING LABELS ON TIN.

By William G. Toplis.

After thirty years of experience with labels curling off from metal surfaces, and after some minutes of careful thought upon the subject, I came to the conclusion that the reason for this undesirable condition was centered in the contracting of the paste, consequent upon its drying. Therefore, I reasoned, that if it were possible to prevent extreme desiccation the label should adhere to metal as well as other surfaces. Accordingly I sought to accomplish this by mixing

glycerin with the paste. The results were indifferent, but encouraging. Finally the idea of applying a coat of pure glycerin to the back of the label suggested itself, and then the problem was solved. The paper absorbs enough glycerin to prevent contraction, yet permits the necessary drying of the adhesive. I find the following a good method to pursue: Keep a convenient supply of glycerin in a wide mouth bottle; when required for use, tilt until glycerin runs into the neck, then return the bottle to a vertical position. It will be found that enough glycerin to moisten the tip of a finger remains within reach. Apply with the finger to the back of the label and immediately paste over it as usual.

ABSTRACTS OF THESES ON CHEMICAL SUBJECTS.[1]

BY J. W. EHMAN.

Extemporaneous Sulphurous Acid. By F. L. Cheney.—Mr. Cheney made numerous experiments having in view the preparation of extemporaneous sulphurous acid by a process similar to that of compound solution of chlorine.

Experiments were first made by adding a solution of tartaric acid to calcium sulphite and also to potassium sulphite, both of which give difficultly soluble by-products. The calcium and potassium salts obtained in the market were, however, found to be so variable in quality that these were rejected.

Sodium sulphite and bisulphite of approximately U.S.P. strength were treated with hydrochloric acid and the sodium chloride formed left in the solution.

The following formula is recommended as giving, after repeated trials, the best results: Dry acid sodium sulphite, 5·7 grammes; dilute hydrochloric acid, 18·5 c.c.; water, 25 c.c. Add the acid to the salt placed in a fair-sized (8 ounce) glass-stoppered bottle, quickly stopper and set aside in a cool place. Agitate slightly to aid solution of the salt and when effervescence ceases add the water and agitate for a few minutes.

The product should measure 40 c.c. and assay from 6 to 6·5 per cent. SO_2.

Liquor Chlori Compositus. By William R. Shearer.—As a result

[1] The experimental work embodied in these theses was performed in the Chemical Laboratory of the Philadelphia College of Pharmacy.

of experiments and analyses made by himself Mr. Shearer concludes that it is impossible, even under the most favorable conditions, to obtain compound solution of chlorine containing ·4 per cent. Cl as prepared by the U.S.P. formula.

The difficulty appears to lie not with the process itself, but with the insufficient quantities of potassium chlorate and hydrochloric acid directed to be taken.

Analyses of the product were made by adding potassium iodide and dilute sulphuric acid and titrating the liberated iodine with sodium thiosulphate V. S.

Following are the results obtained in eight experiments, the first three being made by U.S.P. quantities and the remainder by varying quantities of acid and chlorate :—

Sample No.	Gms. $KClO_3$	C. C. HCl	Water to make	Per cent. Cl found	
				immediately	after.
1	1.25	4.5	250 c.c.	·1488	29 days ·0914
2	"	"	"	·0943	29 days ·0686
3	"	"	"	·21	21 days ·1134
4	2·5	"	"	·1803	21 days ·1048
5	1·25	6	"	·2801	21 days ·1619
6	1·25	7.5	"	·2962	21 days ·1619
7	1·25	9	"	·3447	21 days ·1134
8	2·50	9	"	·4116	

In view of the fact that the more nearly saturated solutions lose Cl more rapidly than the weak ones, Mr. Shearer suggests making the requirements ·1 per cent. Cl and diluting the stronger preparation to the necessary extent.

It is stated that if a fluid ounce of chlorine water (·4 per cent. Cl) is added to a solution of 14 grains pure ferrous sulphate no blue color will appear upon addition of potassium ferricyanide. A quick assay of chlorine water could thus be made by determining the amount of the preparation required to oxidize the iron salt. Adding the necessary amount of water would then insure a weaker but uniform product.

PROFESSOR WILEY ON FOOD PRESERVATIVES IN NORTH DAKOTA.

By R. G. Eccles, M.D.

In the April issue of the American Journal of Pharmacy Prof. Harvey W. Wiley states that my data concerning the deaths in North Dakota, given before the Interstate Commerce Committee of the House of Representatives, at the last pure food hearing, were shown by Professor Ladd to be "wholly erroneous." While it is far from my desire, or intention, to challenge the words of Professor Wiley, I am nevertheless constrained to call his attention to the fact that in the form in which he uttered them the reverse of what he has said happens to be the truth. Perhaps it was his intention to say that while my data were correct Professor Ladd had challenged the conclusion which I drew from those data. So far was the latter gentleman from showing that my data were either partially or "wholly" erroneous that he acknowledged in a public manner that they were correct, and was frank enough to confess that the last issue of the Report of the Board of Health of his State had even strengthened my facts. What he tried to do was to give what he deemed another explanation of these facts. In a subsequent communication I showed him, by official figures, that his explanation could not possibly be the true one; but up to the present time the journal in which the discussion was conducted has failed to publish the reply.

Immediately following the North Dakota crusade against preservatives the Board of Health Report showed a rise of over 60 per cent. in the number of deaths. This was in 1904. Last year (1905) it was still higher, showing a rise in the two years of 120 per cent. In the city of Berlin, Germany, a similar crusade against preservatives was followed, just as closely, by similar results. The fact that no other State showed any such rise as that of North Dakota, and no other German city such a rise as that of Berlin, coupled with the fact that the only thing of a casual nature that happened to these two places and to no other, was the stringent attack on preservatives, makes but one inference appear to be an adequate explanation. Professor Ladd explained the rise in his State as due to an influx of new emigrants who, settling far away from proper medical attention and pure drinking water, fared badly. Unfortunately for this explanation

there was no larger proportion of new emigrants in 1903 and 1904 than there had been for over ten years before, and while former emigrants had in most instances gone into the country those of the years just preceding and during the experiment went chiefly into the towns and cities. (*Bull. Amer. Geograph. Soc.*, April, 1906, p. 226.) Besides this the N. D. Board of Health Report (1903–1904, p. 89) says that these later emigrants were "very young and prosperous people," and adds, "the climate being exceptionally healthful." The facts are thus shown by official records to be the reverse of what they should be if his explanation was a sound one. It is the invulnerability of these facts that makes partisan journals close up discussions on the subject. It surely was not pioneer life nor bad water that increased the number of deaths so largely and in such a sudden manner in Berlin. If he had shown that the population of North Dakota increased 60 per cent. in 1904 over 1903 and 120 per cent. in the second of the years he would have shown that the death rate was steady. But the increase is shown by the 1905 census to have been but 7·4 per year since 1900. The people had been led to expect better health as a result of the raid, and the deaths were more than doubled. The food had been made a better soil for the cultivation of disease germs.

If Professor Wiley is able to show that his chart of the hygienic relations of foods and drugs is even reasonably probable, there can be no excuse for any person ever using preservatives in foods. It is certainly the most remarkable, and entirely original, contribution to the science of the subject that it has ever been my fortune to come across. What a pity it is that he has never once advanced a single fact in evidence of its merit. He gives it to the world as axiomatic, in exactly the same way as the metaphysicians of a former age used to do with their theologo-mathematical speculations. It would be a great boon to all of us if he would cite an authority or two in physiology, pathology, or toxicology who ever entertained his idea, as expressed in his drawing. It has never been my fortune to discover a physiologist or pharmacologist who could so sharply distinguish between foods and drugs. It is generally believed that no such line exists and that they merge into each other. Never before was so powerful a blow struck at the doctrine of Evolution, providing it is true, and it surely should have been shown to Herbert Spencer before he died. If one single substance can be named,

whether a food or a drug, the properties of which can be shown to correspond with Professor Wiley's chart, my conversion to his faith will be so thorough that the rest of my life will be devoted to undoing all that my efforts have done in favor of the use of preservatives.

NATIONAL ASSOCIATION OF BOARDS OF PHARMACY AND THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES.

Report of Joint Committee on Arrangements and Proposed Program, Joint Conference at Indianapolis, Ind., in September, 1906.

Your committee appointed at the Atlantic City meeting of 1905 submits the following report which is published and distributed at this early date in order that all who are directly interested may have ample time to carefully consider the several propositions herewith submitted before the Joint Conference meets. Discussion and action at the Indianapolis meetings will thus be facilitated and rendered fruitful.

We believe that the harmonious co-operation of the Boards and Schools of Pharmacy in the promotion of sound progress and greater uniformity in the educational requirements for license to practice pharmacy, is universally desired. Such co-operation will surely benefit our ancient and honorable profession and elevate the position and services of the pharmacist to higher dignity and value.

Pending the amendment of existing laws in all States where amendment is necessary, the immediate object which it seems to us desirable to attain, if possible, should be the adoption of some definite and reasonably satisfactory general principles and minimum requirements which may be accepted by the great majority as entirely practical and practicable. These principles and minimum requirements should be applied in practice as rapidly as possible in all parts of our country where higher standards do not already obtain, in order that substantial progress toward improved conditions may be begun with a fair promise of success. The ultimate attainment of uniform standards should be held steadily in view.

Each Board and each School is asked to digest these propositions before the Indianapolis Conference takes place. But the pharmaceutical profession of the whole country is directly interested in these

matters and it is, therefore, believed that the American Pharmaceutical Association should be invited to aid us in our work. We have therefore requested the proper committee of the Association to give time upon the program of the Section on Education and Legislation for the consideration of these propositions, and that request has been granted.

After discussion in the Section on Education and Legislation of the American Pharmaceutical Association the propositions may be considered by the separate meetings of the National Association of Boards of Pharmacy and the American Conference of Pharmaceutical Faculties, respectively, should those bodies so decide.

Finally the Joint Conference of the Boards and Schools having had the advantage of full discussion and the advice of the American Pharmaceutical Association will then proceed with its business without being seriously handicapped by the limited time at its disposal.

In obedience to instructions we have prepared the following :—

PROGRAM OF PROPOSITIONS SUGGESTED FOR DISCUSSION AND ACTION.

(1) All laws and regulations governing the licensing of pharmacists should make due distinction between apprentices, clerks and principals, and should establish definite minimum qualifications and indicate the rights and duties of each of these three classes of pharmaceutical workers.

(2) The age of seventeen years and a preliminary general education of one year's satisfactorily completed high school work, or its full educational equivalent, should be the minimum prerequisites to the practical pharmaceutical experience or apprenticeship demanded by the laws, and no drugstore experience acquired at an earlier age or before the attainment of the preliminary education prescribed should be accepted as sufficiently effective to satisfy the intent of the law.

[The adoption of this rule does not prevent the employment of children under seventeen years or with less than one year's high school education in drugstores, it only prevents the recognition or acceptance of their employment as legally admissible evidence of fit preparation for license to practice pharmacy.]

(3) The age and preliminary general education prescribed for legally sufficient drugstore training should also be minimum prerequisites for admission to schools of pharmacy.

(4) Special education for the practice of pharmacy is in this age a necessity and should as rapidly as possible be made compulsory, and the rules of the Boards of Pharmacy should be such as to promote and encourage it in all practicable ways.

The special pharmaceutical education required should include substantial laboratory courses.

(5) Persons who have not given sufficient time and attention to the study of the subjects included in the Board examinations in pharmacy should not be admitted to said examinations. All applicants for admission to such examinations should be required to submit proper evidence that they have satisfactorily completed systematic courses of study in the subjects upon which they are to be examined, which subjects should be named and described in public announcements issued by the Boards.

(6) A Syllabus of Pharmacy Examinations should be prepared by a Committee of this Conference which shall indicate the subjects to be included in the Board examinations as well as in the courses of instruction in the pharmaceutical schools with a view to the attainment of a reasonably uniform standard of minimum requirements which may be adapted by all Boards and Schools.

(7) A national Committee on Examination Questions should be appointed by the National Association of Boards of Pharmacy, which committee should consist of —— members including experienced specialists in the subjects mentioned in the Syllabus of Pharmacy Examinations, who shall, under the direction of the said Association, prepare questions suitable for the examinations to be held by such State Boards of Pharmacy as may avail themselves of the services of said Committee.

(8) Definite and uniform conditions of efficiency should be adopted which all pharmaceutical schools must comply with in order to receive recognition by the Boards of Pharmacy in all cases where students and graduates of such schools receive credit in any form for the courses they have completed or for the time of attendance at such schools, these conditions of efficiency to be made public and to be applied equally to all schools.

The conditions of efficiency prescribed for the recognition of schools of pharmacy should relate solely to matters directly affecting the character of their educational work.

(9) In the determination of the fitness of any applicant to receive a license to practice pharmacy all important facts of his educational history, practical experience and technical services should be taken into account, including his preliminary general education, his special education in pharmaceutical and other related technical schools, his practical experience in pharmacy and the results of the examinations he has passed, and an average of these several factors, each assigned its appropriate value, should be adopted as the passing grade. Substantial credit should be given each candidate for any satisfactorily completed courses of education in pharmaceutical schools according to their extent and character.

(10) Graduates of Schools of Pharmacy registered by the Boards as fulfilling the prescribed conditions of efficiency should be exempt from the Board examinations, except in prescription reading and dispensing, upon presentation of satisfactory evidence that they have successfully completed systematic courses of instruction in such schools extending through two school years of not less than eight months each with not less than twenty-five hours instruction weekly of which not less than sixteen hours shall be laboratory work, the evidence of their graduation being accepted as a sufficient equivalent to the passing of the Board examination, provided all other legal requirements for license shall be fulfilled, and provided further the candidate shall have had two years high-school education; but no person should be granted a license to practice phar-

macy unless he shall have successfully passed a practical examination in the proper reading of prescriptions and the art of dispensing.

(11) No person should be licensed as a pharmacist or given the right to conduct a pharmacy on his own account, or as manager, who has not reached the age of legal responsibility.

(12) The laws and the rules of the Boards of Pharmacy should be so framed and construed as to require sufficient practical experience in pharmacies independently of courses of study, but to the end that substantial courses in the pharmaceutical schools may not be discouraged the laws and the Board rulings should not require persons who take longer courses to wait a correspondingly longer time before they are enabled to secure their licenses. The minimum total period prescribed for both college education and practical experience in pharmacies should, therefore, be the same for all persons without reference to the length of the college courses they may have completed, and should be sufficient to include a full two years' course in a pharmaceutical school.

(13) We recommend to all concerned that the foregoing principles and standards be adhered to in any amendments to the pharmacy laws hereafter proposed in order that national uniformity may be ultimately attained. The minimum requirements indicated, and especially the preliminary general education, should be increased from time to time as circumstances permit.

I. A. KEITH,
GEORGE B. KAUFFMAN,
Z. B. HOPKINS,
F. B. LILLIE,
OSCAR OLDBERG, *Chairman.*

THE PHILADELPHIA BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The *third* stated meeting of this branch was held on the evening of Monday, May 21st, and was devoted to the discussion of "Self-Medication and the Evils of Counter-Prescribing."

Dr. Thomas R. Neilson, Clinical Professor of Genito-Urinary Diseases, University of Pennsylvania, opened the discussion by considering the "Limitations of Self-Medication," more particularly in connection with diseases of the genito-urinary tract. Dr. Neilson referred to the difficulty of making a proper diagnosis in many cases of venereal disorder, the ease with which the several diseases are communicated, and the incalculable amount of harm that has been, and is being, done by neglecting to safeguard the interests of the community in connection with diseases of this kind. Dr. Neilson thought that it was clearly within the province of the pharmacist to discourage the sale of the several nostrums that are advertised in

the daily papers, as specifics for venereal diseases, and to insist that the patient seek proper medical advice and supervision.

Dr. W. M. L. Coplin, Director, Department of Public Health and Charities, Philadelphia, in discussing "Counter-Prescribing and its Relation to Public Health," said that his department was of course primarily interested in the prevention of communicable diseases, as defined by the statutes under which the department had been inaugurated and was now working. He related several specific instances that had led him to make some inquiry as to who was responsible for the prosecution of the guilty parties and also read an opinion from the office of the City Solicitor which had induced him to inaugurate an active campaign for the elimination of irregular practices in connection with the several communicable diseases.

Dr. Coplin then recounted the method of procedure that it is proposed to follow and said that while there will be absolutely no tendency to be unjust or unfair, the practices in connection with several drug stores, of which he had been informed, must be discontinued, because they were inimical to the public health.

Dr. Coplin further said that he felt assured of the support of the better class of pharmacists in the proposed crusade and that it would no doubt lead to a decided bettering of conditions, so far as the interests of the public itself was concerned.

Prof. Charles H. LaWall then spoke of "The Duty of the Pharmacist to Aid in the Elimination of Irregular Practices." Professor LaWall said that while it was true that the practice of counter-prescribing was largely confined to pharmacists who have held aloof from association work it was clearly the province of the better class of pharmacists to enter on a crusade of educating not alone the public but also the physician of the dangers and the risks that are involved in practices of this kind. Professor LaWall called attention to the evident desire of physicians to become better acquainted with the resources and the practices of the better class of pharmacists and advised the members to take advantage of the opportunity now offered and to endeavor to establish more friendly relations with members of the medical profession.

The question was further discussed by a number of the members and visitors present, all of whom appreciated the necessity of some active educational work along these lines.

M. I. WILBERT, *Secretary.*

THE AMERICAN MEDICAL ASSOCIATION.

FIFTY-SEVENTH ANNUAL SESSION.

The remarkably successful meeting of the American Medical Association, held in Boston, Mass., June 5 to 8, 1906, will long be remembered as being numerically the largest and scientifically the most important meeting of that Association in all of the 57 years of its existence.

For the pharmacist, particularly the pharmacist who is at all interested in the development of the professional side of his calling, this fifty-seventh annual session of the American Medical Association was of more than ordinary importance.

It is probable that never before, in the history of the American Medical Association, has the subject of pharmacy, and all that pertains to it, received such serious and such thorough consideration.

While matters relating to pharmacy are usually discussed almost exclusively in the Section on Pharmacology and Therapeutics, they were, this year, also discussed rather freely in the inaugural address of the president, Dr. Wm. J. Mayo, in the several meetings of the House of Delegates, in the meetings of the Section on Practice of Medicine, and even in connection with the Scientific Exhibition, where Mr. Lyman F. Kebler, of the Drug Laboratory, as the representative of Dr. Wiley, exhibited a large number of nostrums and fake proprietary medicines.

Proprietary medicines and nostrums, particularly those of the more objectionable class, received an unusual amount of attention. They were discussed by Dr. George Dock, Dr. Richard C. Cabot and Dr. A. Jacobi in the Section on Practice of Medicine and also by Dr. Solomon Solis Cohen and others in the Section on Pharmacology and Therapeutics. The several papers and the discussions that followed, were augmented, or supplemented, by the exhibition made under the auspices of the Drug Laboratory mentioned above, so that many of the attending physicians had the superfluity, or downright uselessness of the average proprietary compound impressed on them as it never was impressed before. The practical results of these several papers, and of the exhibition that was made in connection with the meeting will largely depend on whether or not the pharmacists of the country are willing and able, to take advantage of their opportunity, to introduce and popularize the official U. S. P. and N. F. preparations.

This is a subject that properly should be taken up and discussed at the meeting of the American Pharmaceutical Association, and also at the meetings of the several State and local societies during the coming year; suffice it to say that the physician has demonstated himself to be not alone willing, but even anxious to learn more of official or standard preparations and to tear himself away from the domineering influence of the nostrum maker.

While Boston itself and the several exhibitions, and incidental social features that were held in connection with the meeting of the American Medical Association, all offered attractions that served to detract from the attendance on the several section meetings, it must be said for the pharmacists who were in attendance, and particularly for the delegates of the American Pharmaceutical Association, that they were more than ordinarily faithful in their attendance at the meetings of the Section on Pharmacology. This faithfulness was largely due, no doubt, to the interesting programme that had been provided and in some respects also to the spirited discussions that followed the reading of many of the papers.

Space will not permit that we reproduce even the six-page programme of the section and we will therefore content ourselves with a simple enumeration of the papers that were more directly of interest to pharmacists, in the order in which they were read.

Even here we cannot do more than enumerate the titles and the reader is advised to peruse the several papers as they appear in the pages of *The Journal of the American Medical Association.*

The Chairman's address, by Thomas F. Reilly, New York City, contained much that is of immediate interest to the pharmacist, and the following papers and reports are all of more or less direct interest:

"The Pharmacology of Digitalis," by Robert A. Hatcher.

"The Pharmacology of Veratrum," by H. C. Wood, Jr.

"Palatable Medication," by H. B. Sheffield.

"Prescribing versus Dispensing," by M. Howard Fussell.

"The Coming Revision of the U.S.P.," by M. I. Wilbert.

"The National Formulary," by C. Lewis Diehl.

"Nostrums and Fraudulent Schemes for Exploiting Them," by Lyman F. Kebler.

"The Limit of Proprietorship in Materia Medica," by S. Solis Cohen.

Report by the Secretary, C. S. N. Hallberg.

"The External Preparations of the U.S.P.," by C. S. N. Hallberg.

These several reports and communications were further supplemented by the following report, made by the Committee on Resolutions, that appears to embody the spirit of the several meetings to such a degree that we take the space to reproduce it in its entirety. The report not alone met with a favorable reception, but was also unanimously adopted and referred to the Board of Trustees of the American Medical Association for their consideration and further action.

(1) The Section of Pharmacology and Therapeutics of the American Medical Association welcomes every endeavor to advance the status of pharmacy as a learned profession, and expresses its full sympathy with the efforts of the American Pharmaceutical Association in this direction. The pharmacist, whether he be a dispenser or a manufacturer, must work hand-in-hand with the physician to consummate the results so urgently desired by both. We recognize that physicians as prescribers must rely upon the fidelity of the pharmacist and of the pharmaceutical manufacturer. Therefore it is highly desirable that more cordial relations and more thorough understanding should be fostered between both professions in order that the limits of legitimate pharmaceutical manufacturing may be more clearly defined.

We believe in regard to pharmaceutical preparations that secrecy concerning any substance possessing the slightest physiologic activity is improper and intolerable. The doctor has a right, and it is his duty, to insist upon the most complete and exact information obtainable concerning the active agents which exist in any preparation he uses.

We deprecate fanciful and inaccurate trade-names and titles, and recommend a more rational and scientific nomenclature in the naming of pharmaceutical preparations and products. We believe that by a system of process patenting a closer approach to ideal conditions can be reached and that it would obviate many of the present features of the pharmaceutical industry to which just objection has been taken. Such tangible protection as is necessary can be given in most instances by the addition of the manufacturer's name to the proper and intelligible title of the pharmaceutical product, thus insuring a recognized grade of accuracy and quality.

(2) The Section believes that the Council of Pharmacy and Chemistry can do much to bring about this desirable state of affairs: and, to the end that its work may be broadened and the results become of as great benefit as possible to the medical profession whose interests it must primarily serve, the Section earnestly recommends that a larger representation be given to clinical therapeutics by the election annually from the working membership of this Section of two members of the Council to serve for one year.

(3) The Section is heartily in favor of and strongly urges the establishment of a National Department of Health, with representation in the Cabinet.

(4) The Section learns with regret that certain manufacturing pharmacists have practically placed the facilities of their plants at the disposal of vendors

of some of the worst and vilest nostrums by which the people of the United States have been defrauded. It is obvious that such practices cannot be too severely condemned, especially if the patronage and confidence of the medical profession is to be retained.

(5) The Section strongly condemns the revolting evils which have been shown to exist in regard to foods and food supplies, especially the meat-packing industry. In the fundamental interests of the people such evils must be controlled by appropriate and adequate legislation, which we strongly urge as a paramount duty of our National Congress.

In connection with the question we wish to emphasize the fact that antiseptics and preservatives cannot mitigate in any degree the dangers from decayed or decaying meat. Antiseptics may destroy putrefactive organisms, but they cannot neutralize toxines or ptomaines. Any contention to the contrary is unsound, and meat that requires such treatment is totally unfit for food, inasmuch as it still contains poisons of virulent and dangerous character.

(6) The Section notes with regret, in examining the commercial exhibit, that the degree of selection which the members of the Association have a right to expect and demand has not been exercised. As a prevention of further abuse in this direction, at future meetings we would recommend that all pharmaceuticals be indiscriminately excluded from the commercial exhibit, or that provisions be made for a committee on exhibit from this Section, which committee shall be empowered to exercise full supervision in the matter and co-operate with the local committee.

H. EDWIN LEWIS, New York,
S. SOLIS COHEN, Philadelphia,
HEINRICH STERN, New York,
Committee.

Prominent among the attending pharmacists was Prof. Henry P. Hynson, of Baltimore, the chairman of the delegation from the American Pharmaceutical Association, who extended the hearty felicitations of that association and was also ever on the alert to defend the pharmacist, his vocation and his rights, whenever occasion offered.

Among other members of the American Pharmaceutical Association who attended the meetings of the Section on Pharmacology and Therapeutics were: C. S. N. Hallberg and W. A. Puckner, Chicago; C. Lewis Diehl, Louisville; Charles Caspari, Jr., Baltimore; Lyman F. Kebler and Reid Hunt, Washington, D.C.; Robert A. Hatcher, Thomas P. Cook and Caswell A. Mayo, New York; Wm. Wescott, Atlantic City; S. A. D. Sheppard and Professor Scoville, Boston; and Prof. S. P. Sadtler and M. I. Wilbert, Philadelphia.

The officers of the Section on Pharmacology and Therapeutics for the coming year are: Dr. H. C. Wood, Jr., Philadelphia, chairman; Dr. Henry R. Slack, Atlanta, Ga., vice-chairman; Dr. C. S. N.

Hallberg, Chicago, secretary; and Dr. S. Solis Cohen, Philadelphia, delegate.

Dr. Joseph D. Bryant, New York, was elected as the coming president of the Association, and Atlantic City was unanimously selected as the meeting place for the fifty-eighth annual session to be held in 1907. M. I. WILBERT.

ALUMNI ASSOCIATION, PHILADELPHIA COLLEGE OF PHARMACY.

The Forty-second Annual Meeting of the Alumni Association of the Philadelphia College of Pharmacy was held on Monday afternoon, May 14, 1906, in Alumni Hall, President F. P. Stroup presiding.

The reports of the officials of the Association for the year 1905–06 were read, and appropriate action taken.

The following officials were elected for the ensuing year: President, John D. Burg, '86; First Vice-President, Charles H. LaWall, '93; Second Vice-President, E. Fullerton Cook, '00; Recording Secretary, Joseph W. England, '83; Treasurer, C. Carroll Meyer, '73; and Corresponding Secretary, Clarence H. Campbell, '90.

The following were elected members of the Board of Directors (to serve four years): Henry C. Blair, '92; George B. Weidemann, '02; Lucien S. Kemp, '99; Lorne E. Hastings, '04.

The following were elected to honorary membership: Nicholas H. Martin, of New Castle-on-Tyne, England; P. C. Candidus, Mobile, Ala.; Dr. J. A. Miller, Harrisburg, Pa.; John F. Patton, York, Pa.

J. W. ENGLAND,
Secretary.

PHARMACEUTICAL MEETINGS.

The regular monthly Pharmaceutical Meeting of the Philadelphia College of Pharmacy was held on Tuesday afternoon, April 17th, with J. C. Peacock, a local pharmacist and chemist, and member of the College, in the chair.

M. I. Wilbert, Ph.M., apothecary at the German Hospital, Philadelphia, was the speaker of the afternoon, and gave an address on

"Benjamin Franklin and His Influence on the Progress of Medicine and Pharmacy in America." (See page 214.)

In discussing the address Mr. Thomas S. Wiegand, librarian of the College, called attention to the fact that Benjamin Franklin was the first secretary of the Pennsylvania Hospital and that the present incumbent of that office is James T. Shinn, treasurer of the Philadelphia College of Pharmacy. Dr. C. A. Weidemann called attention to the bust of Franklin in the Museum of the College, and wondered how long it had been in the possession of the College, saying that to his knowledge it had been in the Institution at least forty years. Prof. Henry Kraemer referred briefly to the career of Franklin, and said that one phase of his genius seemed to consist in his being entirely himself. Prof. C. B. Lowe and Mr. E. M. Boring also took part in the discussion.

Some matters relating to practical pharmacy were presented, but these will be considered more in detail at the next meeting.

The last of the series of pharmaceutical meetings of the Philadelphia College of Pharmacy for 1905–06 was held on Tuesday afternoon, May 15th, M. I. Wilbert, Ph.M., presiding.

William G. Toplis, a pharmacist of Germantown (Philadelphia), was the first speaker and presented two communications, one on "The Pasting of Labels on Tin," and another on "Aromatic Elixir." (See page 332.)

In commenting upon the proposed formula for aromatic elixir, Mr. Wilbert said that instead of passing the distilled water through the filter it would be better to add it afterward, that is, to the finished product, for the reason that the oil would be less likely to be thrown out of solution, particularly in cold weather.

Prof. C. B. Lowe said that one of the simplest ways of applying labels to tin is to roughen the surface of the tin with sand-paper; another method is to apply tincture of benzoin to the tin; and a third way is to add hydrochloric acid to the paste. Professor Lowe then made some remarks on practical pharmaceutical subjects. He said that in making suppositories he preferred the use of a machine for forcing out the suppositories from the mold. He finds that a piece of paper placed over the ice used for cooling the mold not only helps to hold the mold in place but in the case of the divided mold prevents water from entering the mold. Dr. C.

A. Weidemann suggested the use of a pan with a flange for holding the suppository mold in place while being cooled. He thought that one trouble in the making of suppositories consists in allowing the liquid to become too thin before pouring it into the mold. He considered that dusting the mold with lycopodium is an advantage. Dr. Lowe said that some object to the use of lycopodium, but that he saw no objection to its use. He said that it is very important to know just when to add the mass to the liquid cacao, for if the liquid is too hot the medicament will be unevenly distributed. Mr. Wilbert said that he preferred the method of cold compression in the making of suppositories. He thought that the fact that many large manufacturers make them in this way is proof of the superiority of the method. He said that by the use of sufficient force a smooth suppository would result. Mr. Wilbert further said that he had given up grating the cacao butter years ago, and that he had found a meat cutter to be useful for comminuting the cacao butter and also for chopping up certain drugs, and in other ways. In making suppositories by cold compression Mr. E. M. Boring suggested the addition of a trace of lard to the mass and afterward placing the suppositories in a mold for shaping and finishing them. Mr. Toplis approved of the latter method. Mr. J. W. England favored the method of cold compression and shaving the cacao butter in the manner suggested by Mr. Wilbert. Dr. O. W. Osterlund said that he uses a grater for dividing the cacao butter, and a Whitall-Tatum machine of small capacity for molding the suppositories. He said that with this machine he could make three or four suppositories at one time, and that he experienced no more difficulty in making suppositories than in making powders. Mr. Ambrose Hunsberger said that he had been informed that in Scotland it is customary for pharmacists to send prescriptions for suppositories to a suppository maker who is a specialist in this line.

In the making of solutions of argyrol Dr. Lowe recommended first coating the mortar with glycerin so as to prevent the solution from sticking to it. Mr. Wilbert said that the addition of glycerin to the solution of argyrol in the manner suggested is objectionable for the reason that the solution is frequently used as an eye solution. He said that in making eye solutions it is important to avoid contamination as much as possible, and therefore preferred making the solution in the bottle in which it is to be dispensed. Mr. Boring

said that for compounding medicines of this character he keeps on hand small bottles of water which have been sterilized.

Professor Lowe exhibited a label or tag which he attaches to packages sent out to customers and which he has found of advantage in keeping a record of money collected on delivery. The label consists of two parts, one to be retained by the customer, showing whether the purchase has been charged, paid for, or is to be collected, and one to be returned to the store, giving the name of the customer, the amount collected and the amount of change.

Mr. Boring also presented some items of practical interest. He said that the process of powdering balm of Gilead buds is materially assisted by the use of purified talcum. Referring to the fact that official alum is potash alum, Mr. Boring spoke of the repeated attempts which he had to make to obtain this particular salt, the dealer supplying him having furnished ammonia alum instead. In commenting on a prescription which directed the making of 40 grains of extract of ergot, 10 grains of extract of belladonna and 1 grain of strychnin sulphate into 40 pills, Mr. Boring said that the use of a vegetable powder gave too large a pill, but that the use of about 20 grains of spermaceti gave a pill of desirable size and consistency.

Joseph W. England read a paper on "Syrup of Wild Cherry, U. S. P. 1900," (see p. 267).

Mr. Wilbert said that there is some difference of opinion as to the use of syrup of wild cherry. By some physicians it is used as a vehicle only, in which case a thin syrup is better. He also said that a thin syrup or one made without glycerin is more economical, and for this reason he had been omitting the glycerin and replacing it with sugar for some time.

Mr. England was inclined to the view that the therapeutic activity of the preparation is due to hydrocyanic acid and bitter principle, and said that if this be granted, then the strength has been cut down very materially. Mr. Boring recommended placing a pad of cheese cloth in the bottom of the percolator used in extracting the powdered bark. He said that cheese cloth is preferable to sponge, cotton flannel or cotton, and is also useful in making plain syrup if care be taken not to jar the contents of the percolator. Mr. Toplis said that the whole secret of the process of making syrup by percolation lies in providing sufficient drainage, and recommended placing some coarse material in the bottom of the percolator. He said that he

makes syrup for soda water by percolation and that the yield is 5 gallons in 24 hours. Mr. Wilbert said that he uses a pad of cotton which is drawn down through the neck of the percolator and some distance below the mouth, thus setting up capillary attraction, and thereby hastening the operation.

Prof. Henry Kraemer exhibited 25 samples of crude drugs derived from plants grown by the U. S. Department of Agriculture. He said that the College has a complete set of the vegetable drugs thus far produced by the Department and remarked that these specimens are not only useful as type specimens, but that in time to come they will have a historical value.

Professor Kraemer, Philadelphia member of the Committee on Procter Monument of the American Pharmaceutical Association, called attention to the circular letter (see page 285) which has been issued by the association bearing on this subject, and referred briefly to the inception of the movement to thus honor Professor Procter. He stated that the Committee are now inaugurating an active campaign for the collection of funds, and said that he was ready to receive subscriptions to the monument fund. Professor Kraemer said the amount which the committee desires to collect is $25,000 and that he had no doubt this sum would be raised.

Mr. Wilbert said that the subject was an opportune one. He said that it was here in Philadelphia where Procter labored morning, noon and night, and that Philadelphia druggists should seize this opportunity of honoring his memory, for in honoring him they would not only be honoring themselves, but would help in showing to future generations what pharmacy has been.

Several subscriptions were received at the close of the meeting.

FLORENCE YAPLE,
Secretary pro tem.

NOTES AND NEWS.

THE PROCEEDINGS OF THE A. PH. A. at the fifty-third annual meeting, held at Atlantic City, N. J., September, 1905, has just been issued. The frontispiece is an excellent portrait of the late Prof. Albert B. Prescott, who was the President of the Association in 1899–1900. When one looks over the proceedings and sees the amount of original and useful information as embodied in the papers, discussions, reports (including the one on "Progress in Pharmacy"), it is difficult to understand why more retail pharmacists are not members of the Association. It would seem as though with the efforts which are being made to raise the status of the colleges of pharmacy in the United States, the graduates of the various schools would furnish the recruits of the Association. Either the Association should reach these men or they should be taught the value of membership in the Association as illustrated in the proceedings.

THE NATIONAL FORMULARY of Unofficial Preparations (third edition) will shortly be ready for delivery. A considerable number of new formulas have been introduced into the new edition and all formulas of the previous edition have been carefully revised and corrected in accordance with satisfactory results obtained after due investigation, and it is confidently believed that as now given they will prove entirely satisfactory. All formulas dismissed from the 1900 Pharmacopœia, about eighty-four in number, together with thirty obsolete U.S.P. formulas carried in the general text of the Formulary heretofore, have been transferred to the "Appendix."

The National Formulary will be issued at the following prices:

Cloth, plain, $1.00 per copy; cloth, interleaved, $1.25 per copy; sheep, plain, $1.35 per copy; sheep, interleaved, $1.50 per copy. Special discounts will be allowed to dealers and others buying in similar quantities. Delivery of all orders will be prepaid by the Association and will be made strictly in the sequence in which the orders are received. All orders for the National Formulary should be addressed to the General Secretary of the American Pharmaceutical Association, Charles Caspari, Jr., Department of Pharmacy, University of Maryland, Baltimore, Md. Remittances should be made in cash by registered mail, or by P. O. Money Order or New York Exchange. Local checks require collection fee, and should not be sent.

DR. EDWARD KREMERS delivered an address entitled "The College of Pharmacy" at the commencement exercises of the University of Illinois School of Pharmacy. The address has appeared in a number of pharmaceutical journals and is of considerable historical interest as showing the evolution of the colleges of pharmacy, while at the same time pointing out their trend at the present time.

PROF. JOHN URI LLOYD, who is now travelling in the Orient, was in Smyrna early in May. Professor Lloyd is communicating a series of interesting letters on his travels to the *Electic Medical Journal*, the first appearing in the May issue and giving an account of his trip to the Azores.

THE MISSOURI PHARMACEUTICAL ASSOCIATION held its twenty-eighth annual meeting at Pertle Springs, June 12-15. Ninety members, fifty salesmen and about one hundred and fifty visitors were present. President J. F. Llewellyn's

address contained reminiscences of the early experiences of this veteran pharmacist, who, half a century ago, was an assistant in the factory of Dr. Edward Squibb.

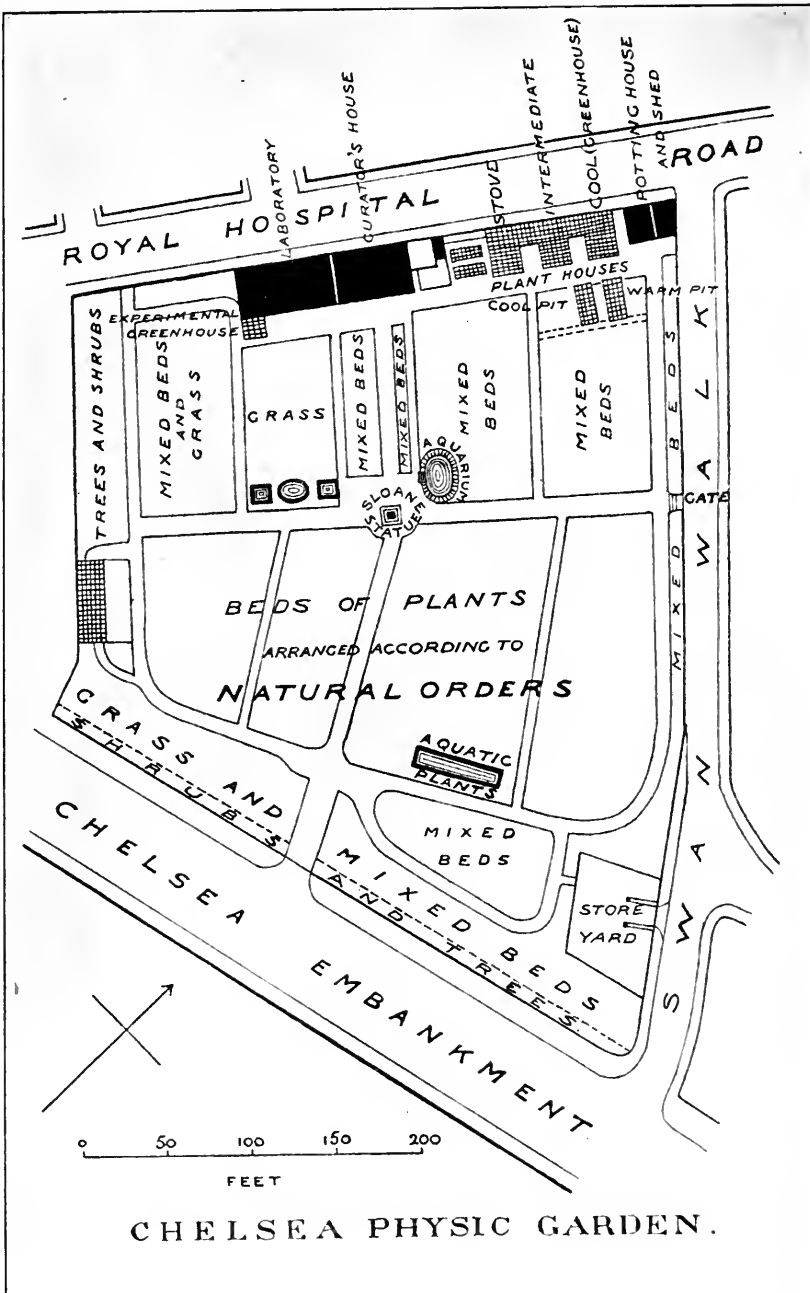
The William Procter, Jr., Memorial Fund (Dr. Otto F. Claus, Chairman) was subscribed to by many members.

The Committee on Drug Adulterations (Dr. Charles E. Caspari, Chairman) reported on a large number of examinations and stated that as a rule the medicines in Missouri answer the requirements of the U.S.P.

The new officers are: President, L. A. Seitz, St. Louis; First Vice-President, J. V. Murray, Warrensburg; Second Vice-President, Louis Grother, Cole Camp; Third Vice-President, Fred Pierce, Nevada; Treasurer, William Mittelbach, Boonville; Permanent Secretary, Dr. H. M. Whelpley; Assistant Secretary, Otis W. Smith, Sedalia. Council: J. F. Llewellyn (Chairman), Mexico; W. E. Bard, Sedalia; Dr. Otto F. Claus, St. Louis; Paul L. Hess (Vice-Chairman), Kansas City; Ed. G. Schroers, St. Joseph.

AMERICAN PHARMACEUTICAL ASSOCIATION.—As was stated in the June issue of this Journal, the Procter Monument Fund Committee of the American Pharmaceutical Association have begun to solicit subscriptions to the Fund in a systematic manner. In response to circular letters sent out about the middle of June Prof. Henry Kraemer has received to date subscriptions amounting to $415, of which $138 are in cash. The following is a list of subscribers, together with the amount subscribed by each:

J. B. Moore	$ 25 00	J. H. Stein	$ 5 00
J. C. Peacock	5 00	Joseph A. Heintzelman	10 00
Lorne E. Hastings	2 00	Florence Yaple	5 00
Edwin L. Newcomb	5 00	William R. Warner, Jr.	50 00
Henry P. Thorn	5 00	Henry Kraemer	10 00
Ambrose Hunsberger	5 00	J. Warren Worthington	2 00
Joseph P. Remington	100 00	William J. Miller	3 00
Edward H. Hance	10 00	O. W. Osterlund	5 00
M. I. Wilbert	5 00	Adolph W. Miller	15 00
L. E. Sayre	2 00	Harry Matusow	2 00
James T. Shinn	10 00	Evan T. Ellis	10 00
Richard M. Shoemaker	15 00	William M. Morrison	5 00
Wm. O. Frailey	1 00	John F. Patton	5 00
Louis Emanuel	5 00	Mahlon N. Kline	25 00
Smith, Kline & French Co.	50 00	Joseph W. England	5 00
J. M. Graves	2 00	John K. Garland	1 00
David Horn, Jr.	5 00	S. E. R. Hassinger	5 00



PLAN OF CHELSEA PHYSIC GARDEN, IN 1905.
(Royal Hospital Road was known, until recently, as Queen's Road)

NOTE.—*The plant houses are indicated by crossed lines, the other buildings by black areas.*

THE AMERICAN JOURNAL OF PHARMACY

AUGUST, 1906.

LONDON BOTANIC GARDENS.

BY PIERRE ÉLIE FÉLIX PERRÉDÈS, B.SC., F.L.S.,
Pharmaceutical Chemist.

A Contribution from the Wellcome Research Laboratories, London.

(*Concluded from p. 325.*)

THE CHELSEA PHYSIC GARDEN UNDER THE PRESENT ADMINISTRATION.

In 1893 the Apothecaries "applied to the Charity Commissioners for a Scheme which might provide for their relinquishment of the trust." On this occasion they were more successful than they had been in their previous negotiations with the Royal Society and the Royal College of Physicians, for, as a result of their application, a Treasury Committee, consisting of Sir Henry Longley, Sir W. T. Thiselton-Dyer, and Mr. Spring Rice, was appointed to inquire into the matter, "with reference to a suggestion that the garden should be supported by Imperial funds, with especial reference to its use by the students of the Royal College of Science at South Kensington." The principal reason advanced by the Society of Apothecaries for abandoning the garden was that the latter was no longer suitable for the purposes of a botanic garden, owing to the deleterious effects of London smoke and the impoverished condition of the soil. The above-mentioned Treasury Committee, however, "satisfied themselves that the garden was still well fitted for botanical purposes, and that its advantages were likely to be highly appreciated by the students of the Royal College of Science and of the various Polytechnics." In view of this favorable report the Charity Commissioners approached the Trustees of the London Parochial Charities to ascertain whether the latter would be willing to provide, or to assist in providing, funds for the maintenance of the garden. The

Trustees, in response to these advances, agreed to contribute £800 per annum towards the upkeep of the garden, while the Treasury expressed its willingness to provide a yearly sum of £150 for the same purpose. The Society of Apothecaries accordingly surrendered the garden on February 21, 1899, and the Charity Commissioners then established a Scheme by which "the Trustees of the London Parochial Charities were created the Trustees of the Garden," while its administration was entrusted to a committee of management constituted as follows:

Nine members appointed by the Trustees.

One member appointed by each of the following: The Treasury, the Lord President of the Council, the Technical Education Board of the London County Council, the Royal Society, the Pharmaceutical Society of Great Britain, and the Senate of the University of London.

One member appointed in turn by the Society of Apothecaries and the Royal College of Physicians.

These members were appointed for four or five years, and, with the exception of the last named, are eligible for reappointment at the expiration of their term of office.

To these sixteen members the representative of Sir Hans Sloane was added as *ex-officio* member of the committee.

In July, 1899, this committee appointed Mr. William Hales as Curator of the Garden, and, on the recommendation of Prof. J. Bretland Farmer, F.R.S., the Professor of Botany in the Royal College of Science, the Trustees were requested by the committee "to expend a sum of £4,230 in new buildings, and repairs and alterations to the existing buildings." The project was subsequently modified, owing to the fact that a sum of £2,000 was realized by the sale "of a strip of frontage to Royal Hospital Road (then known as Queen's Road) to the vestry of Chelsea." This necessitated the pulling down of the Curator's house and other buildings, so that, on the application of the Trustees, an expenditure of £6,000 was ultimately authorized by the Charity Commissioners. The balance (£4,000), was advanced by the Trustees, "to be repaid in thirty years out of the income of the garden," which "consists of the £800 paid by the Trustees, the £150 paid through the Board of Education, and an annual sum of £10 paid by the University of London in consideration of the many and exceptional specimens supplied for examinations."

The buildings were completed in 1902, and on July 25th of that year the garden was formally reopened by the Earl of Cadogan, who is "the *ex officio* member of the committee, and a lineal descendant of Sir Hans Sloane."

With this brief account of the reorganization of the garden we will proceed at once to the description of the garden under the present administration. We shall consider, first of all, the collections growing out of doors, then the plant houses and other buildings, and, finally, the work that is being done in the garden.

The Collections growing out of doors.—When the garden was taken over by the present Trustees it was found to be in a very dilapidated condition, but under the energetic curatorship of Mr. William Hales it has been transformed into the most efficient educational botanic garden in the metropolis. During the years 1900, 1901, and 1902 a liberal supply of turf, loam, manure and gravel was utilized in renovating the garden, and "instruments, tools, pots, mowing-machines, watering-hose, and the many other necessary articles essential to a well-equipped garden" were adequately provided. The stocking of the beds was then proceeded with, the arrangement adopted being shown on Plate XXVI. Plants and seeds were obtained from the various British botanic gardens, and the old plants were correctly renamed so far as possible. Special pains have been taken in labeling the specimens, and old mistakes are nearly all rectified. In rearranging the beds, the special collections of medicinal plants were suppressed and the various patterns of beds which had been in use were reduced to a common type of narrow parallel ones (see Plate XXX), the plants being thereby rendered more accessible. The main portion of the herbaceous collections is located in the southern half of the garden (see Plate XXVI), where the plants are arranged in regular sequence of natural orders according to Bentham and Hooker's *Genera Plantarum.* Over one hundred natural orders are represented, in many cases by medicinal plants. The plants in the "mixed beds" consist mainly of such duplicates as are most frequently needed for teaching purposes. The trees and shrubs are not numerous, but, in addition to those indicated on Plate XXVI, there are a few groups and isolated specimens scattered about the garden (see Plates XXIV and XXX. The following list includes most of the plants of interest in pharmacy that were grown out of doors in the Chelsea Garden in 1905:—

Achillea Millefolium, L.; *Aconitum ferox*, Wall., *A. Fischeri*, Reichb., and *A. Napellus*, L.; *Æthusa Cynapium*, L., fool's parsley; *Agrimonia Eupatoria*, L., the "*Aigremoine*" of the French Codex; *Althæa officinalis*, L.; *Anacyclus Pyrethrum*, L.; *Anthemis Cotula*, L., and *A. nobilis*, L.; *Apocynum cannabinum*, L., Canadian hemp, the root of which is the "*Apocynum*" of the U.S.P.; *Archangelica officinalis*, L.; *Arctium Lappa*, L., burdock, whose root is official in the U.S.P., under the name of "*Lappa*"; *Arctostaphylos Uva-ursi*, Spreng.; *Arnica montana*, L.; *Artemisia Absinthium*, L.; *Arum maculatum*, L., the "*Arum*," "*Gouet*," or "*Pied-de-veau*" of the Codex, with a starchy rhizome from which "Portland Arrowroot" was formerly obtained; *Asarum Canadense*, L., wild ginger or Canadian snakeroot, the rhizome of which contains an aromatic essential oil; *Asparagus officinalis*, L., now little used in medicine, though still represented in the Codex by the rhizome and roots, and by the young shoots (*Turions d'Asperge*); *Atropa Belladonna*, L.; *Avena sativa*, L., whose fruits, freed from their glumes, constitute the "*Gruau d'Avoine*" of the Codex; *Borago officinalis*, L., represented in the Codex by the leaves, from which a *succus* and an extract are prepared, and by the flowers, of which an infusion is made; *Brassica alba*, Hook. f., white mustard, *B. Napus*, L., which yields rapeseed oil, and *B. nigra*, Koch, black mustard; *Bryonia dioica*, Jacq., one of the two species of Bryonia from which the Bryony Root of the homœopaths is obtained; *Calamintha officinalis*, Moench, the "*Calament*" of the Codex; *Calendula officinalis*, L.; *Cannabis sativa*, L., the Indian variety of which yields the "*Cannabis Indica*" of the pharmacopœias; *Carum Carvi*, L., and *C. Petroselinum*, Benth et Hook. f.; *Centaurea Cyanus*, L., whose flower-heads constitute the "*Bluet*" of the Codex; *Chelidonium majus*, L.; *Chenopodium anthelminticum*, L., the "*Ansérine vermifuge*" of the Codex, which yields a volatile oil official in the U.S.P.; *Chrysanthemum Parthenium*, Bernh., and *C. roseum*, Weber, the latter of which yields Persian insect flowers; *Cichorium Intybus*, L.; *Cimicifuga racemosa*, L.; *Cnicus benedictus*, L.; *Cochlearia Armoracia*, L., the horseradish, and *C. officinalis*, L., or common scurvy grass, which, as its name indicates, was formerly much used as a remedy for scurvy, and is still official in the Codex, entering into the preparation of a compound spirit of horseradish and of a confection; *Colutea arborescens*, L., bladder senna, the leaflets of which were stated by Pereira to have been used on the Continent for the purpose of adulterating senna; *Conium maculatum*, L.; *Coriandrum sativum*, L.; *Cucurbita Pepo*, L., which yields pumpkin seed, used as a tænifuge; *Cynoglossum officinale*, L., whose root appears to have been expressly introduced into the Codex to mask the name of a compound opium pill, known as "*Pilule de Cynoglosse*" (cf. the Compound Pill of Soap of the British Pharmacopœia); *Cytisus scoparius*, L.; *Daphne Mezereum*, L.; *Datura Stramonium*, L., and the closely related *D. Tatula*, L.; *Daucus Carota*, L., *Dictamnus albus*, L., the "*Fraxinelle*" or "*Dictame blanc*" of the Codex; *Digitalis purpurea*, L.; *Ecballium Elaterium*, A. Rich.; *Echium vulgare*, L., the flowers of which are generally known in French commerce as "*Fleurs de Buglosse*," although *Anchusa officinalis*, L., is the "*Buglosse*" of the Codex; *Eryngium campestre*, L., the "*Chardon Roland*" or "*Panicaut*" of the Codex; *Fragaria vesca*, the strawberry, whose rhizome and fruit are both official in the Codex; *Fraxinus Ornus*, L.; *Galium Mollugo*, L., the "*Caille-*

RHEUM OFFICINALE. Baill. [?].
Growing in the Chelsea Physic Garden.

RHEUM PALMATUM, L.
Growing in the Chelsea Physic Garden.

lait blanc" of the Codex; *Geranium maculatum*, L., the rhizome of which constitutes the "Geranium" of the U.S.P.; *Geum urbanum*, L., whose astringent roots form the "*Souches de Benoite*" of the Codex; *Glycyrrhiza glabra*, L.; *Gratiola officinalis*, L., the "*Gratiole*" of the Codex; *Hordeum vulgare*, L., whose fruits are used in the preparation of malt extract and for making barley water; *Humulus Lupulus*, L.; *Hyoscyamus niger*, L.; *Hypericum perforatum*, L., whose flowering tops are still retained in the Codex; *Hyssopus officinalis*, L., the "*Hysope*" of the Codex: *Inula Helenium*, L.; *Iris Florentina*, L; *Isatis tinctoria*, L., the woad, which yields a blue dye that was extensively used before the introduction of indigo; *Laurus nobilis*, L., *Lavandula vera*, D.C.; *Levisticum officinale*, Koch; *Linum usitatissimum*, L.; *Malva sylvestris*, L., the leaves and flowers of which are official in the Codex; *Marrubium vulgare*, L, the "*Marrube blanc*" of the Codex, also official in the U.S.P.; *Melilotus officinalis*, Lam.; *Melissa officinalis*, L.; *Mentha Piperita*, L; *Morus nigra*, L., the mulberry tree, whose fruits enter into the preparation of a syrup in the Codex; *Nicotiana Tabacum*, L.; *Nigella Damascena*, L., *Œnanthe crocata*, L., a rank poison which has been mistaken for celery and other *Umbelliferae*; *Ononis spinosa*, L., which yields the "*Hauhechelwurzel*" of the German Arzneibuch; *Opoponax Chironium*, Koch; *Origanum vulgare*, L., the "*Origan vulgaire*" of the Codex, and *O. Majorana*, L., the "*Marjolaine*" of the same work; *Papaver Rhœas*, L., and *P. somniferum*, L.; *Peucedanum Ostruthium*, Koch; *Phytolacca decandra*, L.; *Pimpinella magna*, L, the root of which is official in the Arzneibuch under the name of "*Radix Pimpinellæ*" or "*Bibernellwurzel*;" *Plantago major*, L, *P. media*, L., and *P. lanceolata*, L, all included under the term "*Plantain*" in the Codex, and *P. Psyllium*, L., whose seeds are also official in that work, a mucilage being prepared from them which is similar to the "*Decoctum Ispaghulæ*" of the Indian and Colonial Addendum of the B.P., but the drug used in this case consists of the seeds of *Plantago ovata*, Forsk; *Podophyllum peltatum*, L., the source of the Podophyllum rhizome of the pharmacopœias; *Polygonatum officinale*, All.; *Polygonum Bistorta*, L.; *Potentilla Tormentilla*, Neck., the "*Tormentille*" of the Codex; *Prunella vulgaris*, L., self-heal; *Prunus Amygdalus*, var. *dulcis*, Stokes, which yields sweet almonds, and *P. serotina*, Ehrh.; *Pulmonaria officinalis*, L.; *Pyrus intermedia*, Ehrh, with acid fruits similar to those of the mountain ash; *Rhamnus Frangula*, L.; *Rheum officinale*, Baill.,[1] *R. palmatum*, L., and the variety *tanghuticum*; *Ribes nigrum*, L., the "*Cassis*" of the Codex; *Ricinus communis*, L.; *Rosa canina*, L.; *Rosmarinus officinalis*, L.; *Rubia tinctorum*, L.; *Rumex acetosa*, L., the "*Oseille commune*" of the Codex, and *R. Patientia*, L., which, together with other species of *Rumex*, yields the "*Racine de Patience*" of the same work; *Ruta graveolens*, L; *Salvia officinalis*, L., of which the flowering plant or leaves are official in the Codex, Arzneibuch, and U.S.P.; *Sambucus Ebulus*, L., the source of the "*Baies d'Hièble*" of the Codex, and *S. nigra*, L.; *Saponaria officinalis*, L, whose leaves, stem, and root are official in the Codex; *Scopola Carniolica*, Jacq.; *Scutellaria lateriflora*, L, or skullcap, the "*Scutellaria*"

---

[1] The fine specimen represented on Plate XXVIII is a hybrid between *R. officinale* and *R. Emodi*, but there is also some typical *R. officinale* in the collections.

of the U.S.P.; *Secale cereale*, L., on which grows the ergot of the pharmacopœias; *Solanum Dulcamara*, L., and *S. nigrum*, L; *Spiræa Ulmaria*, L, the "*Ulmaire*" or "*Reine-des-près*" of the Codex; *Stachys Betonica*, Benth., the "*Wood Betony*" of herbalists, still retained in the Codex; *Tanacetum vulgare*, L.; *Taraxacum officinale*, Weber; *Teucrium Chamædrys*, L, the "*Germandrée Chamædrys*" or "*Petit chêne*" of the Codex; *Tilia platyphyllos*, Scop.; *Trigonella Fœnum-græcum*, L.; *Triticum vulgare*, Vill., wheat; *Valeriana officinalis*, L.; *Veratrum album*, L., and *V. viride*, Soland.; *Verbascum Thapsus*, L.; *Verbena officinalis*, L, a worthless drug formerly of great repute, and still official in the Codex; *Vincetoxicum officinale*, Moench, the "*Asclépiade*" or "*Dompte-venin*" of the Codex; *Viola tricolor*, L., the "*Pensée sauvage*" of the Codex, and the "*Sliefmütterchen*" of the Arzneibuch; and *Zea Mays*, L., whose styles and stigmas constitute cornsilk, or the "Zea" of the U.S.P.

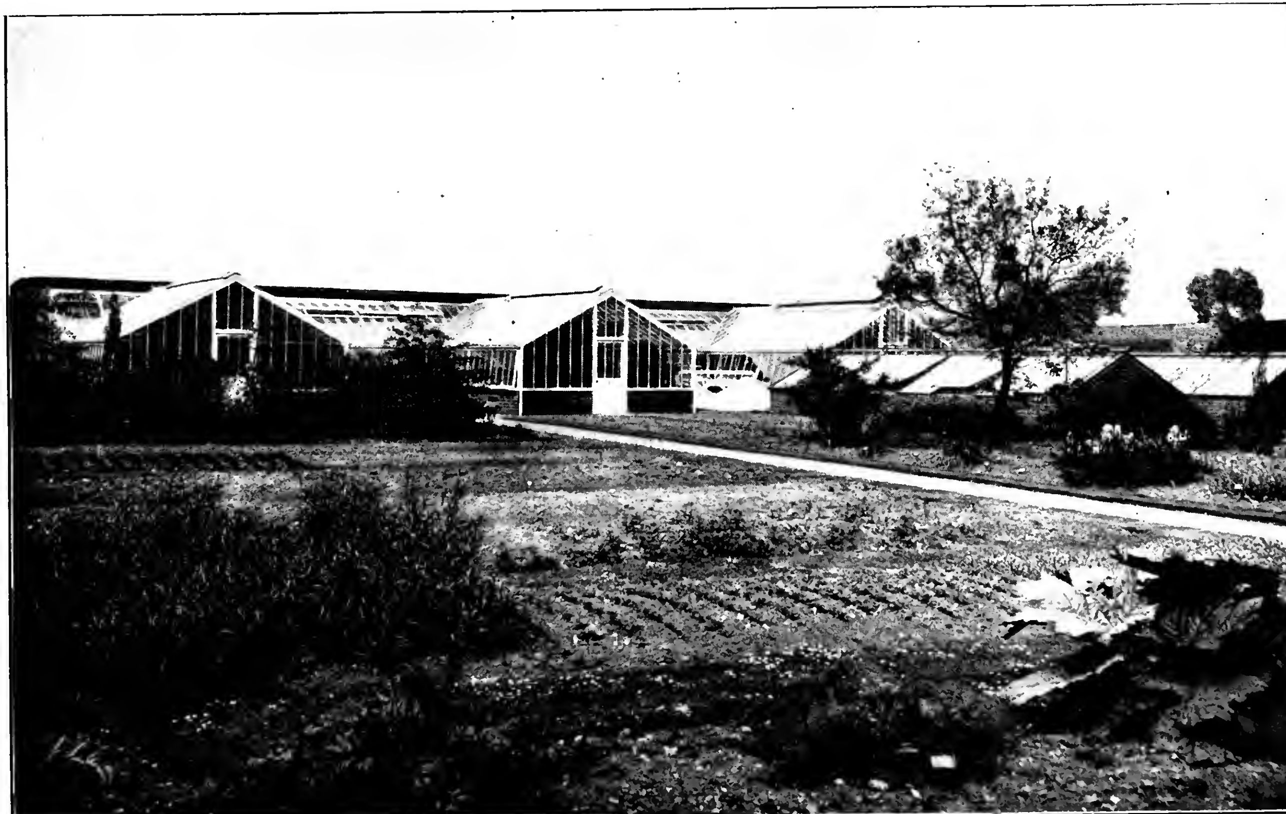
The Plant Houses.—Chief among these is the range of plant-houses completed in 1902, and situated on the north side of the garden (See Plates XXVI and XXX). This type of range is the one that has been found most suitable for educational purposes, and therefore it has also been adopted in the botanic gardens at Cambridge and Oxford. There are three houses in this range, a stove, heated to 65°—70° F., an intermediate house, heated to 55°—60° F., and a cool house maintained at about 45°—50° F., and these all open into a lean-to corridor heated to the intermediate temperature, so that access from one house to the other is made possible without the necessity of subjecting the plants to such great changes of temperature as if the houses only communicated with the outside air. Various kinds of plants are represented, and those of economic interest are distributed among the others. The medicinal plants are not numerous, but the following may be mentioned :—

In the Stove.—*Ilex Paraguayensis*, Lamb.; *Myroxylon toluiferum*, H.B.K., *Zingiber officinale*, Rosc.

In the Intermediate House.—*Adhatoda Vasica*, Nees, whose fresh and dried leaves constitute the "Adhatoda" of the Indian and Colonial Addendum to the B.P.; *Anamirta Cocculus*, W. & A.; *Bixa Orellana*, L.; *Canella alba*, Murr.; *Coffea Arabica*, L.; *Dracæna Draco*, L.; *Peumus Boldus*, Molina; *Phœnix dactylifera*, L.; *Picræna excelsa*, Lindl.

In the Greenhouse.—*Agathis australis*, Salisb., (*Dammara australis*, Lamb.), the Kaurie Pine, from which is obtained a resin similar to copal; *Cinnamomum Camphora*, Nees; *Drimys Winteri*, Forst.; *Eucalyptus globulus*, Labill.; *Melaleuca* sp.; *Rhamnus Californicus*, Eschsch., and *R. Purshianus*, DC.

In the Corridor.—*Aloe* sp., *Ceratonia Siliqua*, L.; *Citrus Aurantium*, L, *C. medica*, L., and *C. medica*, L, var. *Limonum*; *Dracæna Draco*, L.; *Ficus elastica*, Roxb.; *Picræna excelsa*, Lindl.; and *Pilocarpus pennatifolius*, Lem.



RANGE OF PLANT HOUSES, CHELSEA PHYSIC GARDEN.

Facing the range of plant-houses are two pits (see Plates XXVI and XXX), one a warm pit, the other a cool pit. The former contains a collection of cryptogams, such as Selaginellas, Lycopodiums, etc., and other specimens used in teaching; whereas in the cool pit one side is occupied by succulents, and the other is used for forcing purposes. A new propagating house is being added in 1906.

The lean-to-house on the west of the garden is the only one of the old plant-houses remaining. It was thoroughly repaired after the transfer of the garden, and is chiefly used as a fern house. Among its noteworthy features the examples of Wardian cases which it contains may be mentioned, as also a fine collection of liverworts and some luxuriant specimens of the male fern (*Aspidium Filix-mas*, Swartz).

The Laboratory Building, on which abuts the Curator's house, (see Plates VII and XXVI), is the distinctive feature of the Chelsea Physic Garden. It is a plain but substantial brick building, especially designed for modern educational needs under the superintendence of Professor Bretland Farmer. The main laboratory, 40 feet long by 25 wide, is on the ground floor, and opens into a small experimental greenhouse on the side remote from the main entrance (see Plate VII). It is admirably equipped for practical work, the benches being well lighted and provided with water and gas. In this laboratory there are two old oak presses which may have been used for storing Dale's herbarium, although there is nothing to indicate the fact. In addition to the main laboratory there are two small private laboratories at the gable end of the building, and between them is situated a dark room for photographic work. In one of these small laboratories, viz., that which adjoins the experimental greenhouse, there is a third oak press similar to those in the main laboratory. On the upper floor of the building there is, over the main entrance, a small room which is used by the Curator. This contains a small oak press which was manifestly adapted for storing herbarium specimens, and Isaac Rand's name is cut on the inner face of one of its doors. The main room on this floor, which corresponds in size and position with the main laboratory downstairs, is fitted up as a lecture hall, while there are two small rooms over the two small private laboratories and the dark room. These two rooms, and the wall abutting on the staircase and Curator's room, are fitted with book-cases which contain the library of the late

Charles Darwin. Engravings of the garden at various periods are hung on the north wall of the lecture hall, Plates XXIII and XXV being reproduced from two of these.

At the end of May, 1904, a tin tablet recording, in the following terms, the reconstitution of the garden, was placed on the west side of the entrance to the Laboratory Building:—

This Garden was established in the year 1673 by the Society of Apothecaries of London and was at first held on lease, but in 1722 was conveyed by Sir Hans Sloane to the Society for the Encouragement of Botany.

The Garden was managed and maintained by the Apothecaries Society until the 21st January 1899, when by a Scheme of the Charity Commissioners for England and Wales the Trustees of the London Parochial Charities were appointed to be the Trustees of this Garden in the place of the Society. Provision was then made for its management by a Committee appointed by the Trustees of the Garden, the Treasury, the Lord President of the Council, the Technical Education Board of the London County Council, the Royal Society, the Society of Apothecaries, the Royal College of Physicians, the Pharmaceutical Society, the Senate of the University of London, and the Representative of Sir Hans Sloane.

The old Lecture room and Curator's residence having been pulled down in 1900, the present buildings were erected on the same site and formally opened on the 25th July, 1902, by the Rt. Hon. Earl Cadogan, K. G., a lineal descendant of Sir Hans Sloane.

Sir Joseph Savory, Bart.
Chairman.
and
Sir Owen Roberts,
Vice-Chairman of the Trustees.

Wm. Hayes Fisher, M.P.,
Chairman.
and
Charles Algernon Whitmore, M.P.
Vice-Chairman Committee of Management.

Algernon Bertram. Baron Redesdale, *Chairman of the Garden Committee.*
H. Howard Batten, *Clerk.*

DECEMBER, 1902.

The potting-house and the shed, to the east of the range of plant-houses (see Plate XXVI), are to be included among the additions made in 1902, and the inscriptions on the pedestal of the Sloane Statue were also re-cut in that year.

The work of the Garden.—Medicinal plants, as such, no longer form a specialized feature of the Chelsea Physic Garden, inasmuch as the object aimed at by the body at present responsible for the management of the garden is educational in the wider sense, and the teaching of botany as a pure science has accordingly replaced the specialized study of drug-yielding plants. In associating laboratory work with the study of living plants in the botanic garden,

Chelsea has followed the example set by some of our principal university centres. This association, as has already been indicated, is a relatively modern development, and the study of systematic botany which had, until recently, been overshadowed by the rise of laboratory teaching, is now encouraged, side-by-side with the latter.

The garden, as at present constituted, is intended for work, and not for recreation. This is made apparent by the following "Rules and Regulations as to Admission to the Garden, Lecture Room and Laboratory" drawn up by the Committee, and approved on November 20, 1902:—

1. The purposes for which the Chelsea Physic Garden is maintained are:—
   (1) To render assistance in the teaching of Botany;
   (2) To provide material and opportunity for Botanical investigations.

2. Admission to the Garden will be by ticket, issued by the Clerk to the Trustees, and any Teacher who desires to obtain access to the Garden should, in applying for such ticket, state the period for which it is required.

3. The Garden will be accessible to Teachers and Students on week-days from 9.30 a m. to 5 p.m., except during the months of May, June and July, when it will not be closed until sunset.

4. Teachers holding tickets of admission will be allowed to introduce their Students to the Garden for purposes of study, but each Teacher will be held responsible for any damage that may be committed by his or her Students whilst in the Garden.

5. No plants grown in the open ground may be cut or uprooted without the consent of the Curator or some other responsible person directly connected with the Garden, but it is to be understood that permission to gather specimens for the purposes of study will be accorded whenever possible, but in no other circumstances.

6. No plant cultivated in the plant-houses may under any circumstances be cut except by the Curator or some other responsible person directly connected with the Garden.

7. Teachers requiring specimens for use in their own laboratories, on furnishing a list of desiderata, may be supplied with such specimens as can be spared from the Garden on reasonable notice being given to the Curator, and on the understanding that the applicant undertakes the trouble and charges of transfer of the specimens from the Garden to his or her Institution.

8. A ticket of admission to the Garden does not include access to the Laboratory Building. Any person desiring to make use of the Laboratory for purposes of research or otherwise should make special application to the Clerk to the Trustees.[1]

---

[1] I am authorized to state that orders for a visit to the Garden will be given by Mr. Howard Batten, if application be made to him in writing. Address: Mr. H. Howard Batten, clerk to the Trustees of the Chelsea Physic Garden, 3 Temple Gardens, Temple, London, E. C.

In the first report of the Committee of Management it is stated that, in drawing up these rules, "the Committee acted on the advice of Professor Farmer, who, before submitting his recommendations to the Committee, called a meeting of the Principals of the Polytechnics, which was well attended, the interests of at least 150 botanical students belonging to the Polytechnics being represented." The wisdom of this course has been demonstrated by the fact that the rules have, so far, proved quite satisfactory.

In conformity with the suggestion made to the Treasury Committee the needs of the students of botany in the Royal College of Science have been primarily considered. The Professor of Botany in that College has been appointed Scientific Advisor to the Committee of Management, and the laboratory is chiefly used by the students of the college, "working under the direct supervision of Professor Farmer; but occasional admission is granted to other students engaged in research work." The garden itself is used more freely by individual students or by classes in charge of their teachers. Another important branch of the work of the garden, as at Regent's Park, is the supply of cut specimens to many examining and teaching bodies, such as the University of London, the Royal College of Science, a few of the metropolitan medical schools, the various Polytechnics, etc.

The courses of advanced lectures in botany delivered in the lecture hall by specialists in various branches of that science must also be included among the educational features of the Chelsea Garden. These lectures are organized by the University of London, and have been, or will shortly be, given by the following: Professor J. Reynolds Green, Sir William Dyer, Dr. D. H. Scott, Professor J. Bretland Farmer, Professor F. W. Oliver, Dr. A. B. Rendle, Mr. A. D. Hall, Mr. V. H. Blackman, and Professor A. G. Tansley.

The activities of the garden, however, are not altogether limited to educational work. Mr. Francis Darwin has been continuously engaged in research at the Chelsea Garden, and one of the smaller laboratories on the upper floor of the Laboratory Building has been placed at his disposal, while the scientific library formerly belonging to his father, the late Charles Darwin, has been accommodated in the same building, as indicated above. Sir William Ramsay has also made experiments in the garden "in connection with the nutritive value of certain classes of manures," but the Chelsea Garden is

not well adapted for this purpose, as it is only by persistent effort that plants can be made to thrive at all in an uncongenial atmosphere, such as that of London.

The system of seed exchange with other institutions which was inaugurated in 1682 is assiduously maintained, and a seed list is issued annually by the Curator. In the year 1903–04, 872 packets of seeds were received and 1,052 sent away, the recipients or donors comprising the following gardens: Kew, Dublin (Royal Botanical), Dublin (Trinity College), Cambridge, Oxford, Birmingham, Brunswick, Dresden, Erlangen, Kiel, Hamburg, Berlin, Greifswald, Ghent, Brussels, Groningen, Cracow, Görlitz, Innsbruck, Agram, Lemberg, Bucharest, Paris, Lyons (Medical), Lyons (Municipal), St. Petersburg, Palermo, La Mortola, Catania, Valencia, Madrid, Melbourne, Dunedin, and St. Louis (U. S. A.).

[The following should be consulted for further details concerning the Chelsea Physic Garden :

Memoirs, Historical and Illustrative, of the Botanick Garden at Chelsea; belonging to the Society of Apothecaries of London, by Henry Field. London, 1820.

The same, revised, corrected, and continued to 1878, by R. H. Semple, M D. London. 1878.

The Physic Garden at Chelsea, by William Hales, Curator, in "The Garden" for August 2, 1902, p. 79.

The Chelsea Physic Garden.—First Report of the Committee of Management. London. 1905.

The History of the Society of Apothecaries of London, by C. R. B. Barrett, M.A. London. 1905. This work contains many references to the Chelsea Physic Garden, culled from the minute books of the Society. It is, moreover, indispensable to those who wish to make themselves acquainted with the history of the Society. The general reader, however, will find it necessary to obtain some preliminary information respecting the development of the British apothecary before beginning Mr. Barrett's work, as there are, in the latter, references to various legislative enactments which will not be understood without some such assistance. For this purpose see "The Apothecary Ancient and Modern of the City of London," by George Corfe, M.D., London, 1897, and the article "Apothecary" in the Encyclopædia Britannica, ninth edition, Vol. II, p. 198.

No attempt has been made, in the present paper, to deal with biographical details. These are, nevertheless, of great interest, and will be found, for the most part, in Field and Semple or in the "Historical and Biographical Sketches of the Progress of Botany in England, from its origin to the Introduction of the *Linnæan* System," by Richard Pulteney, M.D., F.R.S. In two volumes. London. 1790. The "Biographical Index of British and Irish Botanists," compiled by James Britten, F.L.S., and G. S. Boulger, F.L.S., F.G.S., London, 1893 (First Supplement, 1899), should also be consulted.]

In conclusion, I desire to express my best thanks to the following for the assistance which I have received from them: Mr. H. Howard Batten, Clerk to the Trustees of the Chelsea Physic Garden; Sir William Turner Thiselton-Dyer, K.C.M.G., F.R.S., ex-Director of the Royal Gardens at Kew;[1] Mr. W. Hales, Curator of the Chelsea Physic Garden; Mr. E. F. Hawes, Chief Instructor of the Practical Gardening School in the Royal Botanic Society's Gardens; Mr. J. M. Hillier, Keeper, and Mr. J. H. Holland, F.L.S., Assistant Keeper of the Museums of Economic Botany at Kew; Mr. E. M. Holmes, F.L.S., Curator of the Pharmaceutical Society's Museums; Mr. B. Daydon Jackson, F.L.S., General Secretary to the Linnean Society of London; Mr. A. W. Kappel, F.L.S., and Mr. J. W. Knapman, Librarians respectively of the Linnean Society of London and of the Pharmaceutical Society of Great Britain; Mrs. P. E. F. Perrédès; Dr. F. B. Power, Director of the Wellcome Chemical Research Laboratories; Mr. T. E. Sedgwick, Assistant Secretary to the Royal Horticultural Society; Mr. J. B. Sowerby, F.L.S., Secretary to the Royal Botanic Society; and Mr. W. Watson, A.L.S., Curator, Royal Gardens, Kew.

The illustrations, with the exception of Plate XXV, have been prepared expressly for this work, and for their excellence I am chiefly indebted to Mr. H. S. Wellcome and to the photographic staff of Messrs. Burroughs, Wellcome & Co. Plate XXV is printed from a block kindly lent by Mr. Howard Batten; the other plans I have drawn myself.

LONDON, December, 1905.

ADDITIONS AND CORRECTIONS.

Oct., 1905, p. 454, line 21, *for* "August 7, 1865," *read* "August 7, 1685."

Nov., 1905, p. 524, line 5, *for* "In 1784" *read* "In 1772."

Dec., 1905, p. 564, line 20, *for* "1784" *read* "1772."

Jan., 1906, p. 2, line 3 from bottom, for "*Prunus amygdalus*" read "*Prunus Amygdalus.*"

Jan., 1906, p. 3, lines 3-4, *for* "sources respectively of otto of rose, hips and red-rose petals" *read* "sources respectively of hips, otto of rose and red-rose petals."

Jan., 1906, p. 3, line 15, for "*Ulmus compestris*" read "*Ulmus campestris.*"

" " p. 4, line 32, for "*Peucedanum ostruthium*" read "*Peucedanum Ostruthium.*"

---

[1] Sir William Dyer retired from the post of Director in December, 1905, and Lieutenant-Colonel David Prain, I.M.S., F.R.S., then Director of the Botanical Survey of India, was appointed as his successor.

Jan., 1906, p. 5, line 25. *Veratrum viride:* Solander is frequently cited instead of Aiton as the authority for this name. For explanation see footnote, p. 526, AMERICAN JOURNAL OF PHARMACY, Nov., 1905.

Jan., 1906, p. 6, line 2 from bottom, for *Œgle Marmelos*" read "*Ægle Marmelos*."

Jan., 1906, p. 7, line 31, for "*P. Longum*" read "*P. longum*."

Feb., 1906, p. 71, line 24, *for* "order on Council" *read* "Order in Council."

" " p. 72, line 18, *for* "years" *read* "years.'"

April, 1906, p. 178, line 15 and line 7 from bottom, *for* "Watt's" *read* "Watts's."

May, 1906, p. 225, line 14, *for* "1898" *read* "1899."

June, 1906, p. 272, bottom line, *for* "wo" *read* "two."

REPORT OF THE PENNSYLVANIA STATE PHARMACEUTICAL ASSOCIATION MEETING.

HELD AT GLEN SUMMIT SPRINGS HOTEL, JUNE 26, 27, AND 28, 1906.

BY CHARLES H. LAWALL.

The opening session of the twenty-ninth Annual Meeting of the Pennsylvania Pharmaceutical Association was held in the Auditorium of the Glen Summit Springs Hotel on Tuesday, June 26, 1906.

The location of the hotel is well adapted for a convention of this kind, and the attendance at this annual meeting showed that the selection had been well made. Situated as it is on the main line of the Lehigh Valley Railroad, but a few miles from Wilkesbarre, it proved to be readily accessible to all the members in the eastern part of the State, and the large number of those from the west, from Pittsburg, Allegheny, etc., showed that they, too, considered it advantageous as a meeting place.

The meeting was called to order by President D. J. Thomas, of Scranton, and the afternoon session, which was an innovation begun last year, was primarily intended to expedite the transaction of routine business, receiving of committee reports, etc., so that the later sessions could be given up to more weighty matters of more general interest.

The report of the Secretary was first presented by Dr. J. A. Miller, of Harrisburg, in which he called attention to the large number of copies of the proceedings which remained in his hands, owing to a number of the members not having paid their dues, and, therefore not being eligible to receive them. He asked permission of the Association to send these proceedings out to druggists in the

State who were not members, in order that they might appreciate one of the benefits of belonging to the Association.

The Treasurer's report was read by Mr. J. L. Lemberger, of Lebanon, who reported a balance of $1,476.82. He commented upon the large number who had fallen behind in the matter of the payment of dues, stating that it was rather to be expected after the phenomenal growth of the last two years in which many persons joined without really intending to continue membership.

Reports of committees and delegates were then called for.

Charles Leedom, of Philadelphia, represented the Philadelphia Association of Retail Druggists.

Prof. Joseph P. Remington and F. M. Apple, of Philadelphia, represented the Philadelphia Branch of the American Pharmaceutical Association.

Dr. Clement B. Lowe spoke in behalf of the Alumni Association of the Philadelphia College of Pharmacy, as well as of the membership of the college itself.

Mr. W. L. Cliffe represented the American Pharmaceutical Association and called the attention of the members to the fact that the Treasurer, Mr. J. L. Lemberger, was now President of the American Association. Mr. Lemberger, upon being addressed by the Chair, spoke eloquently in behalf of the Association, which is the highest one of its kind in this country, devoted to the professional as well as the trade interests of pharmacists.

Mr. Whipple, of Bridgeton, N. J., represented the New Jersey Pharmaceutical Association, while Mr. Jacob S. Beetem, of Wilmington, Del., represented the Association of his State.

A congratulatory telegram was received from Dr. Whelpley, from St. Louis.

The report of the Entertainment Committee as to the programme that had been outlined for the diversion of the members and the ladies who were present, was presented by Mr. D. E. Bransome. The Busy Bees, as this committee is facetiously termed (their names being Bransome, Byers and Busch), have never yet failed to make good when it came to entertaining the members, no matter how limited the means at their disposal.

The Report of the Committee on Papers and Queries was presented by the Chairman, Professor Charles H. LaWall, who announced that the number of papers presented at this session would

break all previous records, and that the Association would, as in the past, stand next to the American Pharmaceutical Association in the variety and importance of the papers presented, many of which had required much time in their preparation.

The president appointed an Auditing Committee, consisting of Messrs. Wray, Gorgas, and Grohman.

Mr. John C. Wallace, of Newcastle, Penna., presented the report of the Legislative Committee, in the absence of the Chairman, Mr. H. L. Stiles, of Philadelphia.

Fraternal greetings from various local associations were given by Messrs. Redsecker, Potts, Nagle, and others.

The Secretary was ordered to send telegrams expressing the desire of this Association for the success of other State Association meetings which were being held at the same time, after which the session adjourned.

The evening session was called to order at 8.30 by President Thomas, who stated that owing to the enforced absence of the Speaker who was to deliver the address of welcome to the members of the Association, that part of the evening's programme would have to be omitted. He would, however, call upon Dr. Lowe to respond on behalf of the members, to the address which should have been given. Dr. Lowe, in his customary style, entertained the members with a short speech, after which Mrs. D. F. McMurtrie, of Altoona, responded in behalf of the ladies.

Vice-President S. A. Stright having been called to the chair, President D. J. Thomas presented his annual address. It was a carefully prepared review of many important events which have taken place during the past year in legislative and trade interests, and contained recommendations for the registration of apprentices, the enactment of a law deciding the ownership of prescriptions, and the awarding of a medal for the most meritorious paper presented at each annual meeting.

The Committee appointed to consider these recommendations consisted of Messrs. Hay, Walton, Pritchard and McIntyre.

Prof. Joseph P. Remington, at the request of President D. J. Thomas, who had resumed the chair, gave a glowing outline of the work which was being done in behalf of the Procter Memorial, which was inaugurated several years ago by the American Pharmaceutical Association, and which was now assuming tangible shape.

He was seconded in this effort by Dr. Clement B. Lowe, who read a paper on the subject presented by Professor Henry Kraemer, who is the secretary of the committee appointed by the American Pharmaceutical Association to take charge of the collection of funds for this purpose and chairman of the committee appointed by the Pennsylvania Pharmaceutical Association. After the adjournment of the meeting, the Entertainment Committee provided a series of biograph views which were thrown on a screen stretched at the far side of the lawn, so that it could be viewed by the members seated along the entire length of the porch of the hotel.

The Wednesday morning session opened with the reading of minutes of the previous session, after which the report of the Committee on Trades Interests was presented by the Chairman of the Committee, Mr. Charles Leedom, of Philadelphia, after which the meeting was turned over to the Chairman of the Committee on Papers and Queries, who presented the following papers which were read by the authors in some cases, and by some one delegated to the performance of that duty when the author was not present.

"The Preparation of Tooth Paste," by Henry C. Blair, of Philadelphia.

"Simple Elixir as a Vehicle in Children's Prescriptions," by Edgar F. Heffner, of Lock Haven.

"Tinctures from Fluid Extracts," by Isaac M. Weills, of Harrisburg.

"Some Improved Formulas," by P. Henry Utech, of Meadville.

"The Sale of Cigars by Pharmacists, and Methods of Advertising the Cigar Trade," by J. B. Moore, of Philadelphia.

The afternoon session on Wednesday was opened by receiving the report of the Committee on Adulterations presented by the Chairman, Mr. R. H. Lackey, of Philadelphia. This comprehensive report, which was a compilation of the work of a number of persons, and which showed great attention to detail on the part of the Chairman who had been untiring in its preparation, reviewed the condition of the drug market at the present time, and it was stated that there is less wilful adulteration at the present time than ever before, the instances where it took place being due rather to negligence or carelessness, than any attempt to deceive. This view was supported by numerous letters from prominent wholesale and manufacturing houses, who had responded generously and com-

prehensively in outlining the existing conditions in the wholesale trade.

A short address on Sunday closing was given by Rev. Sharp, of Philadelphia, who was introduced by Mr. Bone, of Dunmore, Penna.

The Auditing Committee reported having examined the Treasurer's accounts, and having found them satisfactory.

The Nominating Committee, consisting of Messrs. Stine, Redsecker, Potts, Apple, and Byers, reported the following nominations:—

For President: George A. Gorgas, of Harrisburg.

For First Vice-President: William F. Lee, of Philadelphia.

For Second Vice-President: John C. Wallace, of Newcastle.

For Secretary: Dr. John A. Miller, of Harrisburg.

For Treasurer: J. L. Lemberger, of Lebanon.

For Executive Committee: L. L. Walton, of Williamsport, Kroll Keller, of Harrisburg, and J. B. Raser, of Reading.

The Committee on Papers and Queries then took charge, and the following papers were read:—

"Is it true that the United States Pharmacopœia is more of a Manufacturer's Handbook than a Pharmacist's Guide?" by Professor Joseph P. Remington, of Philadelphia.

"Doses in the United States Pharmacopœia of 1900," by Clement B. Lowe, of Philadelphia.

"Laboratory Notes," by Charles E. Vanderkleed, of Philadelphia.

"A Digest of the Digestive Ferments," by Franklin M. Apple, of Philadelphia.

"A New Method of Making Granular Effervescent Salts," by J. Percy Remington, of Philadelphia.

"The Physician and the Pharmacopœia," by B. E. Pritchard, of McKeesport.

"The Preparation of Thymol Iodide," by Frederick E. Niece, of New York.

"Laboratory Notes," by Willard Graham, of Philadelphia.

"Notes on the Alkaloidal Assay Processes of the New Pharmacopœia," by Professor Frank X. Moerk, of Philadelphia.

"Some Novelties in Analytic Methods," by Professor Henry Leffmann, of Philadelphia.

"Are Show Windows an Advantage in Suburban Sections?" by William G. Greenwalt, of Philadelphia.

"Some Notes on the Detection and Destination of Boric Acid," by Charles H. LaWall and H. A. Bradshaw, of Philadelphia.

On Wednesday evening, the Entertainment Committee provided a programme of popular and classic music, by Alexander's Ninth Regiment Band of Wilkesbarre, which was thoroughly enjoyed by the members, and which was followed by a new collection of biograph pictures shown as on the night previous.

The Thursday morning session opened with a discussion on the time and place of next meeting. Two places were suggested: Paxinosa Inn, at Easton, and the Bedford Springs Hotel, at Bedford Springs, Penna. After an exhaustive discussion, which was participated in by many of the members, it was decided to accept the recommendations of the Committee, and to hold next year's meeting at the Bedford Springs Hotel. Mr. Jordan, of Bedford, was elected local Secretary.

The report of the Committee appointed on the day previous to investigate the charges against a member of the State Pharmaceutical Examining Board for allowing the questions to be placed upon the market previous to the October examination, was received.

The Committee on Papers and Queries then took charge, and Dr. Clement B. Lowe, of Philadelphia, exhibited Sullivan's Prescription File, after which Mr. Louis Emanuel, of Pittsburg, showed a new Portable Oxygen Generator. Both of these were discussed very thoroughly.

The reading of papers was then resumed, and a number of papers on trade interests, especially with reference to the so-called patent medicine evil, were read, as follows:—

"The Present Status of Patent Medicines," by B. E. Pritchard, of McKeesport, Penna.

"Patent Medicine Agents or Prescription Compounders, which?" by Franklin M. Apple, of Philadelphia.

Papers in answer to the Query No. 23: "Has not the pharmacist of the past few decades sold his birthright for a mess of pottage, in joining hands with the manufacturers of proprietaries in helping them to further their interests at the ultimate expense of his own?" were read by the following members: W. O. Frailey, of Lancaster; J. Layden White, of Philadelphia; George M. Beringer, of Camden, N. J.; John F. Patton, of York, and John R. Thompson, of Pittsburg.

The reading of these papers was followed by a lengthy, and, at times, a somewhat heated discussion.

The Association passed resolutions at this session endorsing the Council of Pharmacy and Chemistry, of the American Medical Association.

The following papers were read by title, owing to a lack of time of the session to allow them to be read in full:—

"Popularizing Standard Preparations," by M. I. Wilbert, of Philadelphia.

"The Preparation of Tasteless Castor Oil," by J. B. Moore, of Philadelphia.

"Our Future Pharmacists or a Labor Problem," by F. M. Siggins, of Meadville, Pa.

"Effervescent Solution of Citrate of Magnesia," by Fred. S. Nagle, of Wilkesbarre.

"What is the Most Effective Method of Advertising for the Retail Druggist," by Lorne E. Hastings, of Philadelphia.

"Does a Soda Fountain Pay?" by James S. Gleghorn, of Pittsburg.

"How the National Association of Retail Druggists has Benefited Retail Druggists," by Thomas H. Potts, of Philadelphia.

The report of the Committee on President's Address, endorsing most of the recommendations made therein, was the concluding feature of the final business session.

The Evening Session was taken up, as is the custom, by the installation of the incoming officers, the Executive Committee, and the Entertainment Committee, together with brief addresses by a number of the ex-presidents of the Association who were present.

The hotel orchestra furnished music for the Choral Society of the Association, which was organized and conducted by F. T. Wray, of Apollo, Pa., to whose successful efforts the members of the Association owed a most enjoyable evening.

In reviewing the work of the Association for the year, credit must be given to the members for the hearty support which they gave to the officers in their attendance at the business sessions. During the past few annual sessions, an almost continuous rainfall has enforced attendance at these business sessions, but it is a noteworthy fact, and one which speaks well for the future of the Pennsylvania Pharmaceutical Association, that notwithstanding the continued clear weather, which was as fine as though it had been ordered for the occasion, the attendance at the business sessions was better even than

on the previous occasions referred to. The ladies, many of whom were present, were entertained, as usual, during the business sessions, by euchre parties, carriage drives, guessing contests, bowling contests, etc., and it was the opinion of nearly everybody that the Association never had a more enjoyable or a more profitable meeting in its history. The one disadvantage of the location was the fact that the hotel is so near the railroad, that the passage of the many through trains made the efforts of some of the speakers fruitless, and it was customary, after the first day's sessions, to stop the proceedings until the train had passed by.

Many of the members remained at the hotel for the balance of the week, some of them taking side trips, as to Wilkesbarre and nearby points of interest, and it was very evident from the spirit shown that more and more of the members are looking forward each year to making this particular week a period of enjoyment as well as profit.

ABSTRACTS OF PAPERS.

Formula for Tooth-Pastes.

By Henry C. Blair.

The author stated that the difficulty usually experienced in formulas for tooth-pastes is found in that the liquids and solids do not stay mixed; that the glycerine separates on the top, and the sediment goes to the bottom in such a manner that the preparation is useless. He suggested a formula which had proven satisfactory in his hands, and which was free from this objection. The formula was as follows:—

Soft soap, made from cotton-seed oil, 1 ounce; glycerine, 8 ounces; starch, ½ ounce; water, ½ fluidounce; precipitated carbonate of calcium, 8 ounces; oil of peppermint, ½ ounce; coloring matter as desired.

A glycerite of starch is first made with the starch, glycerine, and water; the soap is then added, followed by the coloring and flavoring ingredients, and a thorough mixture is made. The precipitated chalk, which should be bolted through a No. 14 bolting-cloth sieve, is then gradually added, and the whole worked up into a smooth paste. The author suggests that any desired flavor may be used, and that carmine coloring seems to be more popular than any other. If made in large quantities, he suggests the use of a putty

machine, or a bread mixer, or some mechanical device for thoroughly stirring it, as it becomes very tough, and requires considerable power to mix it in large quantities. For filling the tubes, a sausage stuffer has been found most advantageous.

Simple Elixir as a Vehicle in Children's Prescriptions.

By Edgar F. Heffner.

The author suggests that in many instances physicians are either not aware, or do not realize the amount of alcohol which is present in simple elixir, and in prescriptions for children, several of which were submitted as having been taken from the author's files. The amount of alcohol sometimes reaches a proportion which would not be given were the physician made aware of the condition of affairs. He also gave an example of a prescription containing sodium bromide, chloral hydrate, and simple elixir, in which a layer of chloral alcoholate separated out sometime after dispensing, which, if unnoticed, would allow the patient to take all of the chloral in the first dose, as the chloral alcoholate is the lighter of the two liquids and forms the top layer. He suggests the use of an aromatic water as a vehicle in all of these types of prescriptions as being certain to obviate any danger. The value of these suggestions was readily understood, and the secretary of the Association was directed to have 100 copies of the paper prepared, one of which was to be sent to each medical journal in the United States.

Tinctures from Fluid Extracts.

By Isaac M. Weills.

The author takes the view that the using of standardized fluid extract for making tinctures of powerful drugs would lead to greater uniformity than the present method of preparation where the pharmacist may, possibly, have a drug which is much higher than the allowable standard, and thus make a preparation which is more powerful than a similar preparation made from a different lot of the drug. He also comments on the lack of care in collecting drugs at the proper season in order to get their greatest efficiency.

Some Improved Formulas.

By P. Henry Utech.

The author suggests that in the official spirit of peppermint, a much more satisfactory preparation can be made by allowing the

peppermint herb to macerate in water for several hours, to free it from the drug extracted. By this means the resulting spirit will have a more permanent green color than when made according to the official directions. He also suggests that doubling the quantity of peppermint herb gives a decided improvement, and that the same criticism may apply to a spirit of spearmint, both as to the method of preparation and the quantity of herb used. He suggests a method of circulatory displacement, in making tincture of iodine, by suspending the iodine and potassium iodide near the surface of the alcohol in a muslin bag. He suggests an improvement in Warburg's tincture of the National Formulary in that the ingredients be macerated for forty-eight hours, instead of digested, as in the present directions, and he also suggests the use of quinine bi-sulphate in place of sulphate in this preparation on account of its greater solubility.

The Sale of Cigars by Pharmacists.

By J. B. Moore.

The author states that the sale of cigars by pharmacists has steadily grown for a number of years until now they have become an important part of the stock of a well-equipped drug store, being no longer considered as a side line in the better class of stores. He states that many druggists make a mistake of not catering to the popular demand, or to individual preferences for certain brands of cigars, and gives advice as to how to arrange the display stock of this kind to the best advantage. He dwells at some length on the proper method of keeping the stock in prime condition, as there is no quicker way to lose the cigar trade than carelessness about this feature. Carefully written circulars should frequently be distributed. Neat, catchy and attractive signs and show cards should be placed in conspicuous positions; he presents a number of forms for show cards, and also suggests wording for many catchy signs to help this feature of the trade.

Is it True that the United States Pharmacopœia (8th Revision) is more of a Manufacturer's Hand-book than a Pharmacist's Guide?

By Prof. Joseph P. Remington.

The author states that, notwithstanding the many criticisms and discussions on the Pharmacopœia which have appeared in the phar-

maceutical and medical journals during the past year, no attempt has been made by the chairman of the Committee of Revision to make answers except in the few instances when he happened to be present at a meeting where the subject came up. It is interesting to observe that the questions which occasioned the most discussion in the Committee of Revision have been criticised the least up to the present time with the possible exception of the dose question. It is natural to expect that there should be criticism, and it indicates the widespread interest in the work itself. The subject of the adulterations in medicine and food, which has become so important to the laity recently, has been responsible for the close scrutiny given to standards such as are set forth in the Pharmacopœia. The function of the Pharmacopœia is not to lead in the matter of introducing new remedies, but to control, to select, and to devise standards, and to give its stamp of authority to preparations in general use by improving them and securing uniformity and strength. The criticism that it has become a book of standards is a just one; that is its primary function. It is certainly to be considered a manufacturer's hand-book because there is no doubt that the pharmacist of to-day sells more products manufactured by others, than he does preparations made by himself; and it is a pharmacist's guide, because, by its use, the pharmacist is enabled to keep the manufacturer's goods up to the standard. It must be recognized that the number of preparations which can be more economically manufactured on a large scale, is continually growing, and it would be a suicidal policy for the pharmacist of the present time to make many of the preparations which were made by the pharmacist of twenty-five or thirty years ago. The policy of the present Pharmacopœia has been to encourage the manufacture of every preparation that could possibly be made by the retail druggist. Many valuable suggestions were contributed by representatives of the manufacturing interests, and elaborate experiments were made by individual members of the committee with the sole object of encouraging the pharmacist to make many preparations for himself. The making of one's own preparations would not only increase the standard, increase the actual practical knowledge of the sciences, elevate the pharmacist above the mediocre ability of the tradesman, and educate the assistants that he employs, but would, above all, increase the respect of the physician who depends upon him for accurate and safe phar-

maceutical knowledge, and it can, therefore, be truly said, that the Eighth Revision of the United States Pharmacopœia has furnished, after great labor, standards for manufacturer's goods, but it has not neglected its no less important duty, that of furnishing a reliable pharmacist's guide.

Doses in the United States Pharmacopœia of 1900.

By Clement B. Lowe, M.D.

The author states his disinclination to join those who criticize simply for the sake of criticism, but desires to call attention to a few facts in connection with the feature of doses in the Pharmacopœia. He states that this is the second time that doses have been included in the United States Pharmacopœia, as they were previously given in 1830, when the doses of Materia Medica articles alone were given. After tabulating a number of specific instances, the author concludes that the doses as given in the present Pharmacopœia are rather less than the average as given by other authorities. He concludes by making a few comments on some of the changes in preparations and titles, and praises the general excellency of the work.

Laboratory Notes.

By Charles E. Vanderkleed.

Spirit of Nitrous Ether. The author answers the query as to whether the spirit prepared from concentrated nitrous ether meets the requirements of the Pharmacopœia for strength in the affirmative with the proviso that the proper precautions must be taken. He states that he has never found a sample of the concentrated nitrous ether under strength, but that carelessness in diluting would result in an inferior preparation. The best method of diluting the spirit is to thoroughly chill the bottle containing the concentrated nitrous ether, and then open it with the neck below the surface of the alcohol, which should be of slightly less volume than that necessary to dilute the whole quantity of the bottle. By then making an assay, using an inverted burette for a nitrometer, uniform results can be obtained. He states that no allowance is made for vapor tension in the U.S P. calculations of the ethyl nitrate strength of this preparation, which correction would make the result slightly lower. The author criticizes the U.S.P. pepsin assay by stating

that it is very difficult to thoroughly disintegrate the coagulated egg albumin by means of a glass rod tipped with rubber as directed, but that vigorous shaking is quite effective, and he states that the strict method of inverting the bottle once every ten minutes should be adhered to, as a more vigorous shaking gives the sample too great an advantage. With reference to the U.S.P. test for phenol and cresol, the author states it is much easier to apply this test when 5 c.c. of each of the reagents are used instead of one as directed, and furthermore states, that as much as ten per cent. of phenol can be added to cresol without being detected by this test. He advocates the use of iodeosin as an indicator in alkaloidal assay, as it gives more delicate readings than any of the other indicators used in this class of work.

A Digest of the Digestive Ferments.

By Franklin M. Apple.

The author presents a study of the digestive ferments used at the present time, giving elaborate tabulations of the comparative number of times each was prescribed in one year, also giving the number of physicians prescribing the substance in each case. Several points are of interest in the examination of this tabulated matter. The very frequent prescribing of proprietary digestive mixtures was noticed, especially the predominance of starch-digesting compounds, and the very infrequent prescribing of pepsin, and almost complete neglect of pancreatin were very surprising features. He appends extracts from the literature of proprietary manufacturers setting forth the extravagant claims made for some of these digestive mixtures. In conclusion, he states that there is no doubt that the animal digestive agents are being replaced to a large degree by those of vegetable origin, and recommends that a higher test of pepsin should be made official, that the purity of pancreatin should be improved, and that diastase of malt should receive greater attention as a digestive, and comments upon keratin coated preparations of such digestive agents as are desired to reach the intestines before exerting their action.

A New Method of Making Granular Effervescent Salt.

By J. Percy Remington.

The author comments upon the disadvantages of the present method of granulating the sticky mass which results after heating

the ingredients together, and making the granular effervescent salts whereby a great deal of the material is lost by becoming so finely powdered as to be of no commercial value. He suggests the use of a device which he exhibited which consisted of a sieve of Number 6 meshed galvanized wire, mounted on a frame in such a way as to permit a solid bottom to be inserted. An ordinary pie crust roller completes the apparatus which is to be used as follows: After preparing the mixture, it is spread uniformly on the sieve while the bottom is in place, and the apparatus is then placed in a hot closet or oven at the proper temperature. When the mass has begun to soften and has become thoroughly moistened, the apparatus is removed from the oven, the solid bottom is withdrawn, and the sieve frame is placed over a receiving box. The roller is then passed over the soft mass, which is thus forced through the sieve in such a way as to cut it into uniform particles with absolutely no waste in the shape of fine dust.

The Physician and the Pharmacopœia.

By B. E. Pritchard.

In introducing the subject the author states that when we speak of the pharmacopœia in conversation with a physician, we talk in what to him is an unknown tongue, and he gives a number of instances in support of his contention that the real difficulty lies in the fact that physicians, as a rule, know little and care less about the pharmacopœia, a condition which is due to the lack of reference to it with sufficient emphasis in the Medical College courses. He calls attention to a resolution which was offered last year at the N.A.R.D. to put a corps of competent detail men in the field, to exploit to the physicians the U.S.P. and N.F. formulas, and he states that until that association is financially able to do this work, it is the duty of the individual druggist to acquaint the physicians in his own neighborhood with these important subjects.

The Preparation of Thymol Iodide.

By Frederick E. Niece.

The author suggests the following formula as having given very satisfactory results in his hands for the preparation of the foregoing compound: Thymol, 1 ounce; potassium hydroxide, 1 ounce; potassium iodide, 1 ounce; iodine, ½ ounce. Dissolve the potassium

hydroxide in one pint of warm water, then dissolve the thymol, which should be very finely powdered in this solution, then dissolve the potassium iodide in one pint of water, and dissolve the iodine in this solution which may be called Number 2. Combine these two solutions by mixing with constant stirring, and allow the mixture to stand for a time. Add one pound of chlorinated lime to two gallons of water, and pass chlorine gas into the solution for a few minutes. Place this solution in a five-gallon earthen vessel, and add the combined solutions previously referred to, mixing well by constant stirring. In a few minutes a copious reddish brown precipitate will form, which should be allowed to completely settle, then wash with large quantities of water acidulated with hydrochloric acid, using six ounces of acid to the gallon of water. This frees the precipitate from excess of lime and alkalies. Follow this treatment by washing thoroughly with pure water until the water fails to redden blue litmus paper. Dry the precipitate at a temperature of not more than 98 degrees F. The yield should be from four to five ounces at a cost of from twenty to thirty cents an ounce. If the process is carefully carried out, the product will answer all the official requirements.

Laboratory Notes.

By Willard Graham.

Some interesting analytical data obtained in the examination of a large number of samples were presented which embraced the following substances: Acetone, acid benzoic, acid phosphoric, antimony and potassium tartrate, asafœtida, belladonna leaves and root, cochineal, cresol, ether, guaiacol, oil of camphor, oil of citronella, oil of cloves, oil of coriander, oil of lavender flower, oil of lemon, oil of sandal-wood, mace, gum opium, potassium iodide, resorcin and castile soap.

Notes on the Alkaloidal Assay Processes of the New Pharmacopœia.

By Frank X. Moerk.

The author gives an elaborate tabular arrangement of some of the details of the assay processes which upon careful examination discloses several important points. First: Comparison of the alkaloidal strength of drugs and their preparations shows that the usually relied upon statement that 1 c.c. of a fluid extract is the equivalent

of 1 gramme of a drug, is not correct in all cases, as shown by the fluid extract of aconite, hydrastis, nux vomica, pilocarpus, ipecac, conium, colchicum, and hyoscyamus. Second: Many of the so-called 10 per cent. tinctures do not represent exactly 10 per cent. of the drug, such as tinctures of stramonium, aconite, hyoscyamus, colchicum, physostigma, hydrastis, cinchona, and nux vomica. Third: In the case of extracts there is noted the same variations from the commonly accepted strength as compared with the drug. Fourth: The alkaloidal factor, as given in each assay process, does not always coincide with the factor as given in the tables under the volumetric solutions. Fifth: An interesting tabulation is given of the amount of decinormal acid neutralized in each assay process.

Some Novelties in Analytic Methods.

By Prof. Henry Leffmann.

First: Precipitant for nitrates; a new compound has been discovered which produces a white flocculent precipitate in dilute solution of nitrates. The systematic name of the body, which is a complex pyrrhol derivative, is diphenyl endanilo-dihydrotriazol, which has wisely been given the common name of nitron. The weight of the precipitate collected from a solution cooled to zero centigrade collected and weighed on the tared filter multiplied by a point 167 — HNO_3. Second: a volumetric determination of sulphates is described, which depends upon the fact that benzadin sulphate is very sparingly soluble in water and acids, and that benzadine hydrochloride can be titrated like a free acid with sodium hydroxide, using phenolphthalein as an indicator. Third: The detection of potassium by a new precipitant found in the commonly used photographic developer called eikonogen, which is a sodium naphthol sulphinate. This reagent is sufficiently delicate to detect the potassium radical in cold solutions of potassium chlorate and potassium acid tartrate. Fourth: The detection of ammonium compounds by a method more delicate than an assay test is accomplished by the addition of a few drops of a 10 per cent. solution of potassium iodide followed by a solution of sodium hypochloride added drop by drop, in the presence of even very small amounts of ammonium compounds a brown precipitate of the so-called nitrogen iodine is formed. Fifth: The reaction with sesame and hydrochloric acid can be used for detecting cane sugar in milk sugar, since the latter

does not give the same reaction with this test. Sixth: The detection of abrastol is accomplished by adding a reagent prepared by dissolving mercury in twice its weight of nitric acid and diluting the solution with five volumes of water. This produces a yellow color deepening to a reddish color in the presence of abrastol. The test can be applied directly to milk, but with fruit juices, etc., the abrastol must be separated in a manner similar to that in testing for salicylic acid.

Some Notes on the Detection and Estimation of Boric Acid.

By Charles H. LaWall and H. A. Bradshaw.

The authors comment upon the commonly used turmeric paper test which is used for the detection of boric acid, but which, as usually applied, is not as sensitive as is desirable. The use of turmeric tincture, and the application of the test to the liquid directly which is to be evaporated so as to leave a thin film on a watch glass, is the method advocated. With milk the test is very satisfactory, as applied directly. With meat products, it is only necessary to heat the sample with water, and then take a small amount of this aqueous liquid for the test. With substances which have no ingredient which would leave a film, such as is left in the two foregoing cases, the authors propose the use of a 5 per cent. gelatin solution. By the use of this method, boric acid can be readily detected in sea water. The proportion is shown approximately by the intensity of the red color which results when boric acid is present. Some experiments were made with the Gladding method for the estimation of boric acid, by distillation with methyl alcohol, to determine the rate with which the methylborate distils over, and it was found that it is necessary to distil more than 100 c.c. of the methyl alcohol in order to recover all of the boric acid, as on three separate distillations, where 100 c.c. were collected, 95 and 96 per cent. respectively were recovered. It was also found that large amounts of sodium chloride had no effect upon the accuracy of this process.

Are Show Windows an Advantage in Suburban Sections?

By William G. Greenwalt.

The author deplores the lack of attention which is given to this important department of a drug store, giving instances of good and bad methods, and the effect on possible customers. He states that

you cannot attract customers unless you put something attractive into the windows, and advocates the idea of having seasonable displays, which should be looked after by the proprietor himself, or delegated to some active, alive, and energetic clerk. It is the one legitimate method of increasing business, and the natural outcome of a careful study of it will be a better income, greater profits, increased interest in business and a more healthy atmosphere about the establishment.

The Present Status of Patent Medicines.

By B. E. Pritchard.

The author takes the subject of Query No. 23, which asks whether the pharmacist has sold his birthright for a mess of pottage in promoting the sale of proprietaries, and answers it emphatically in the negative. He admits that it appears upon the surface that overmuch attention may have been given, and an undue amount of energy expended in efforts to restore former profits upon proprietary medicines, but he states that patent medicines are not all bad, nor are all proprietors deserving of being classed as brigands simply because of the presence of a few yellow streaked ones in their ranks. He states that the traducers of proprietary medicines are vicious iconoclasts, in that they do not suggest anything to take their place, and in conclusion states his belief that those who have carried on the crusade have taken up arms against a sea of imaginary troubles.

Patent Medicine Agents or Prescription Compounders, Which?

By Franklin M. Apple.

The author classes the patent medicine and proprietary manufacturers in their relation to the professional pharmacists, as like unto oil and water which will not mix without an emulsifying agent. He deplores the extravagent claims made for their wares by most of the manufacturers of patent medicines and proprietaries, and calls attention to the exposure of the magazines, and of the lay press during the past year. In support of his view, he quotes an editorial from the *World's Work*, entitled "The Patent Medicine Muzzle on the Press," and advocates missionary work in educating druggists and doctors up to the possibilities in the use of standard preparations of the U.S.P. and National Formulary.

Answer to Query No. 23.
By W. O. Frailey.

This query, which asks whether the pharmacist has sold his birthright for a mess of pottage in furthering the sale of proprietary remedies, is answered in the negative by the author, who states that his views have been modified by the continued and largely increasing habit by physicians of prescribing sarsaparillas and other specifics of proprietary manufacture on written prescriptions. He calls attention to the gigantic accomplishments of the N.A.R.D. which has enabled the retailer to negotiate with the manufacturer of proprietaries for honest open markets, and to demand protection from demoralizing influences.

Answer to Query No. 23.
By J. Leyden White.

The author of this paper has, as in the foregoing case, answered the query in the negative. He states that the query assumes something which is not a fact, and ingeniously traces the first proprietary remedy to Galen, the Father of Medicine, bringing the subject down through the succeeding ages to the present time. He states that the average physician of to-day depends very little upon diagnosis, but goes upon the principle that what has helped ninety-nine out of a hundred similar cases, will most likely help the hundred and first. In considering the commercial side of the question, he estimates that 40 per cent. of the average retail pharmacist's business is in patent medicines, that if these were abolished, 40 per cent. of the retail druggists would fail. In conclusion, he says that the query is born of a temporary condition of the times, that condition arises from the agitation of the so-called reformers who are trying to put shackles on Father Time, trying to reverse natural laws, trying to change progression to retrogression.

Query No. 23.
By George M. Beringer.

The author handles this query in an allegorical manner and takes the extreme degree in stating the affirmative. He quotes Mr. William C. Alpers, who portrays the pharmacists as upon the raft of commercialism floating toward the Niagara of annihilation, and states that succor and safety come in the nature of the lifeline of profes-

sionalism. In the writer's opinion the raft of commercialism is nearing a whirlpool, he says the time has arrived when it becomes imperative for pharmacists to seize the lifeline.

Query No. 23.

By John F. Patton.

The author states that his answer must be tinged with regret at the loss of that which can never return, namely: wasted time, and lost oppportunity. He says for years all the forces of condition and circumstances, to say nothing of his education and training, have conspired to make the pharmacist a tradesman, and regrets that there seems to be a lack of professional pride and ambition in the pharmacist who is willing to trade in and to a certain extent stand sponsor for the many nostrums he is daily called upon to hand out over his counter, instead of making an effort to produce and sell his own goods.

What Should be the Attitude of the Pharmacist in Reference to the Crusade Against Patent Medicines?

By John R. Thompson.

The author states that it is either right or wrong to sell proprietary medicines to the public, and while allegations have been made concerning nostrums in the lay journals, the pharmacist has so far maintained an attitude of guilty silence. He admits that some harm is worked on the public by charlatans in the trade, as there is harm worked by the bad element in every calling, but that the traffic has become so enormous that the goods are sold simply as merchandise, without any responsibility being assumed by the seller. He believes that the selling of ready-made remedies is honorable and legitimate, providing that the medicines themselves are honorable and legitimate, and concludes by saying it is the duty of the pharmacist to protect his business, to aid the crusaders where they have discovered a real wrong, but to oppose them most heartily when they attack what is legitimate and right.

Popularizing Standard Preparations.

By M. I. Wilbert.

The author compares the curriculum of the average college of pharmacy of to-day and that of the average college of medicine of to-day,

with the curricula of these institutions thirty years ago, and states that materia medica, pharmacy, and chemistry, have been so far crowded out by other branches in the medical college that it has led to a condition which it would be well to remedy. He advises the pharmacist to enlarge his fund of general scientific information, so as to be able to intelligently direct the physician in the application and use of official remedies, and that a more frequent and liberal interchange of opinions and experiences will be necessary, and will go far towards establishing the sense of responsibility the pharmacist should have as being in part the guardian of the public health. He believes that the time has come for radical changes in the practice of pharmacy, but that much will depend upon the pharmacist's ability to take advantage of the opportunities now afforded to him, and to live up to the responsibilities that he has assumed.

The Preparation of Tasteless Castor Oil.

By J. B. Moore.

The following formula is suggested for a mixture to disguise the repulsive taste of castor oil: Compound tincture of cardamom, 2 drachms; cinnamon water, 6 drachms; castor oil, 1 fluid ounce; brandy, q. s. Mix the compound tincture of cardamom in cinnamon water, add the castor oil carefully and squirt four or five drops of good brandy on the surface. He suggests a label for prepared castor oil which contains explicit directions as to how to take the dose, and gives a number of instances of his experiences in building up a trade in this particular method of administration of a usually nauseous substance.

Effervescent Solution of Citrate of Magnesia.

By Fred. S. Nagle.

The following is suggested by the author as giving a very satisfactory preparation:—

Citric acid, 1 ounce; magnesium carbonate, ½ ounce; potassium bicarbonate, ½ drachm; spirits of lemon, 5 minims; simple syrup, 1½ ounces. Boiling water to make 12 ounces. The solution is made by directions similar to those of the U.S.P. and is stated to give a more permanent preparation.

Our Future Pharmacist, or a Labor Problem.

By F. M. Siggins.

The author states that the ordinary pharmacist of the present time has no room for a laboratory such as he should have if he is to follow up his college education. He would advocate the opening of the college doors to all who desire an education, irrespective of previous educational requirements.

What is the Most Effective Method of Advertising for the Retail Druggist?

By Lorne E. Hastings.

The author states that there is no one rule for effective advertising. He advocates intelligent and systematic use of window displays, the maintenance of a cleanly condition of the door, and prescription department, advantageous arrangement of goods in show cases, and systematic and periodic circular advertising in the locality of the store. He advertises the wrapping of small folders containing seasonable advertisements with each package sent out, and states that this form of advertisement, if persistently and consistently followed, will materially increase sales.

Does a Soda Fountain Pay?

By James S. Gleghorn.

The author states that a great deal depends upon the locality, as the policy which would prove successful in one case might be a failure in another. It is not so necessary to have a good fountain as it is to keep the one you have in good condition. He cites instances of mistakes that have been made by druggists to put in expensive fountains simply to keep up the style, and calls attention to the necessity for politeness on the part of the soda dispenser. He advises the pharmacist to get out a line of new drinks every week throughout the season, and to furnish a printed list showing the variety and prices of drinks served. He does not believe in giving free drinks, or in distributing free tickets with other purchases, and concludes by saying that it takes money, pure water, clear ice, rich fruit syrups, work, and know-how to make a soda fountain pay.

How the N.A.R.D. Has Benefited the Retail Druggist.

By Thomas H. Potts.

The author says that the status of the retail druggist at the present time is not to be envied, and yet it is immeasurably superior to what it would be were it not for the protection of the N.A.R.D. This Association protects its members from encroaching cut-rate competition and aggressive and pernicious legislation. It demands of its members more generous support and greater activity in meeting the various disturbing issues which confront it. He endorses the direct contract, serial numbering plan, and states that mail-order business has been entirely eliminated in this class of goods. The Association is in a position to help every druggist to improve his position as a business factor whether he be located in a country district or in a city store. He concludes that an organization of 30,000 retail druggists who are working together for the betterment of their kind, financially, morally, and professionally, is a power in the land, as it ought to be, and every druggist who is imbued with the spirit of craft kinship and realizes the harmonizing power of co-operation should be a member of this organization.

COMMENTS UPON THE U.S.P. INORGANIC CHEMICALS.

By Virgil Coblentz.

(*Continued from p. 311.*)

ACIDS, INORGANIC.

Sulfuric Acid.—The strength of 92½ per cent., known commercially as 66 Be., has been retained because this represents the commercial acid as used in the arts and decided upon by the Manufacturing Chemists' Association. Such a strength acid cannot be further concentrated in platinum without injury to the apparatus. It is estimated that the loss in platinum in concentrating this acid amounts to from 5 to 10 cents per ton, while an acid of 95 per cent. will cause a loss about four times as much.

Again, the various other industries employ a 92½ per cent. acid, as, for example, the petroleum refiners find this strength best adapted to their wants; a stronger acid causing discoloration of the oil.

The amount of this acid employed in pharmacy amounts to but

very little, hence we must adapt ourselves to the commercial conditions.

Hydrochloric Acid.—A 31·9 per cent. or 20 Be. is the usual acid employed in the arts. Another acid used much industrially is the 22 Be., which is about 36·18 per cent. strength.

Nitric Acid.—The strongest nitric acid used in the arts and manufactures is the 42 Be., which represents a strength of 68 per cent. Hence, for like reasons cited under sulfuric acid, the strength of this is made to conform to commercial standards.

Not the least difficulty should be experienced in procuring the above acids fully up to the pharmacopœial standards.

Boric Acid.—The strength of 99·8 per cent. allows for the presence of about 0·2 per cent. of moisture, such possible impurities as calcium and sodium sulfate are not found in more than traces in boric acid of reliable origin.

Hydrobromic Acid.—In order to provide against the presence of other acids, two methods of titration have been introduced, namely, by neutralization and by precipitation.

Sulfuric Acid, Aromatic.—In order to secure uniformity in strength, based on the percentage of absolute sulfuric acid present, as is the case with our dilute acids, the quantity of sulfuric acid has been placed at 111 c.c., or 203·24 grammes.

Phosphoric Acid.—It will be noted that a saturated solution of sodium chlorid is added to the solution of phosphoric acid to be titrated, which is done for the following reasons: When titrating phosphoric acid under ordinary conditions the end-reaction is not sharp, phenolphthalein giving a rose tint when two-thirds of the acid has been neutralized, thus:

$$H_3PO_4 + 2NaOH = Na_2HPO_4 + 2H_2O.$$

According to the phenolphthalein reaction, di-sodium phosphate is slightly alkaline. If, however, this solution is diluted, the coloration disappears, for dissociation takes place as follows:

$$\overset{+}{Na_2}\overset{+}{H}\overset{-}{PO_4} + \overset{+}{H}\overset{-}{OH} = \overset{+}{Na}\overset{-}{OH} + \overset{+}{Na}\overset{-}{H_2}\overset{-}{PO_4}.$$

In order to suppress this hydrolysis, a slight excess of sodium chlorid is added, the end-point of titration is then very sharp.

A sample of phosphoric acid which assayed 82·8 per cent. gravimetrically (as magnesium pyrophosphate), titrated 82·35 per cent.

with phenolphthalein as indicator; methyl-orange gives lower results, namely, 81·17 per cent.

Sulfurous Acid.—The extemporaneous preparation of small quantities of sulfurous acid after the U.S.P. 1890 formula is usually attended with variable success. A number of experiments were made with the view of modifying the process so that the resulting product might be more uniform in strength. The following is a summary of our results.

	Per cent. SO_2
(1) U.S.P. method ('90) with 500 c.c. water, not cooled	1·35
(2) " " " " " " ice cold	2·24
(3) " " " " " " "	3·00
(4) Charcoal 10 grammes. H_2SO_4 50 c.c. Water, cold, 500 c.c. in 2½ hours	6·4
(5) Charcoal 10 grammes. H_2SO_4 80 c.c. Water, cold, 500 c.c. in 2½ hours	6·6
(6) Charcoal 20 grammes. H_2SO_4 60 c.c. Water, cold, 500 c.c. in 3½ hours	7·4
(7) Copper 60 grammes. H_2SO_4 80 c.c. Water, cold, 500 c.c. in 1 hour	6·2
(8) Copper 75 grammes. H_2SO_4 160 c.c. Water, cold, 1000 c.c. in 2½ hours	4.3
(9) Copper 30 grammes. H_2SO_4 80 c.c. Water, cold, 500 c.c. in 1 hour	4.45
(10) Copper 20 grammes. H_2SO_4 60 c.c. Water, cold, 500 c.c. in 1 hour	2.5

In experiments 1, 2 and 3 the requirements of the U.S.P. '90 were closely followed, using 500 c.c. of water in the receiver in place of 1000 c.c. as directed. In all other experiments the solution of sodium carbonate was dispensed with, for when used, the greater portion of the sulfurous acid was found in the last receiver and but little in the first, where it would be expected. In order to obtain a saturated solution of the gas, there must be a slight back-pressure exerted in the absorption flask. This cannot be brought about by the use of an alkali solution in the second flask, owing to the readiness with which the gas is absorbed. In order to free the sulfurous

from sulfuric acid, various devices were tried, such as the use of two or more wash-bottles, the use of lead oxid, etc. None of those tried were sufficient to retain all the vapors of sulfuric anhydrid which are given in the operation (especially when Cu is employed) and carried over mechanically with the sulfurous oxid.

The chief objection to the copper method is that the metal becomes quickly coated with an insoluble layer of sulfates, when reaction ceases. This is less marked with the spiral-formed turnings than with the granulated or filings. Charcoal is a cheaper and far more convenient material, and when properly carried out the method will yield a stronger solution than the copper.

The rapid deterioration of sulfurous acid solutions may be noted on the following two samples.

		Per cent.		Per cent.
June 17	Sample I,	6·56	Sample II,	4·54
" 18	"	6·40	"	4·43
" 23	"	6·08	"	4·27
July 1	"	5.92	"	4·20

The old method of titrating by adding the standard iodin V.S. directly to the diluted acid, is open to the error introduced through the reducing action of the hydriodic acid formed on the sulfur dioxid. The present method (Giles and Schearer, *Jour. Soc. Chem. Ind.* iv, 303) avoids this in adding an excess of the iodin solution and titrating back with the thiosulfate V.S. The results are very accurate and concordant.

Alum.—In revising this text, the question arose as to the advisability of retaining the *Potassa Alum* or introducing the *Soda Alum;* also of rigidly excluding the *Ammonia Alum.* A letter directed to one who is thoroughly informed upon this subject, brought the following facts: "When ammonium sulfate was very much cheaper than it is at present, and before the importation of the potassium sulfate, now obtained very cheaply from the Stassfurt deposits in Germany, ammonia alum was made; but now ammonium sulfate is rarely used in making alum. It has happened that where ammonia alum is manufactured for special purposes, the mother liquors from it were evaporated together. A small quantity of alum of commerce may have been found to contain ammonia from the above-named cause, but the proportion of ammonia present must have been very small.

"Soda cannot be used for the manufacture of alum for the reason

that it makes a very soluble salt, and impurities associated with the sulfate of aluminum and sulfate of sodium used, are not removed by crystallization from the alum. Again, in my experience, soda alum cannot be crystallized except from strong solution of sulfate of aluminum, in which it is slightly soluble, and even when obtained, it effloresces so that it loses water of crystallization, under ordinary circumstances, destroying the crystalline appearance of the salt and rendering it not constant in strength."

Alumini Sulphas.—The U.S.P. stands almost alone in recognizing a salt with 16 molecules of water of crystallization, while all other pharmacopœias require a salt with 18 molecules. Examination of American-made samples showed that the percentage of water varies from 45·49 to 45·6 per cent., while a sample of Merck's contained 44·92 per cent. of water; 16 molecules of water of crystallization represent 45·7 per cent. of water, 15 molecules represent 44·10 per cent. of water, hence we are justified in retaining the old text.

Ammonium Benzoate.—The solubility of this salt varies according as to whether it is of neutral or acid reaction; the latter condition is more usually met with because of the readiness with which the salt loses in ammonia gas on standing.

Ammonium Carbonate.—The composition of this unaltered salt is represented by equal molecular quantities of acid carbonate and carbamate which yield theoretically 32·55 per cent. of ammonia gas. The British Pharmacopœia limits the ammonia strength of this salt to 31·66 per cent. Various samples of the unaltered translucent salt confirm this accepted formula. A salt which consists of two molecules of the bicarbonate to one of the carbamate, yields only 22·88 per cent. of ammonia. The U.S.P. '90 standard was 100 per cent., which is difficult to comply with. With the improvements made recently, the standard of 97 per cent. is not difficult to maintain.

Ammonium Salicylate.—This salt is furnished either as a crystalline anhydrous salt or crystallized with one-half molecule of water. Merck's salt, which is in colorless well-defined crystals, is anhydrous, and has evidently been crystallized from alcohol. Others of American origin are either in large irregular crystals with one-half molecule of water, or an anhydrous fine crystalline powder. Ammonium salicylate is quite as stable as the other inorganic ammonium salts. At 100° C., it commences to slowly volatilize, and at this temperature does not lose over 0·75 per cent. of ammonia. The percentage of ammonia yielded by the samples examined:—

No. 1 = 10·99 to 10·96 per cent. NH_3 and 89·07 per cent. of salicylic acid; moisture, 0·11 per cent. (traces of phenol).

No. 2 = 10·93 to 10·95 per cent. NH_3 and 88·36 per cent. of salicylic acid; moisture, 0·16 per cent.

No. 3 = 10·16 per cent. NH_3.

Theory = 11 per cent. of NH_3 and 89·00 per cent. of salicylic acid, corresponds to anhydrous salt.

Theory = 10·39 per cent. of NH_3 and 84·12 per cent. of salicylic acid, salt with half a molecule of H_2O.

All the salts contain necessarily a slight excess of salicylic acid. A 98 per cent. salt as adopted by the U.S.P. allows 2 per cent. for free salicylic acid and moisture.

Antimony Oxid.—Very little if any of this chemical is made in this country, all being imported. Little if nothing is known of its origin and quality. The analysis would indicate that the samples, although from distant sources in this country, were obtained from the same parties abroad. These were found to be insoluble in acids, alkalies and organic acids. Evidently this antimony oxid consists of a mixture of various antimonic acids. Such a product is of but little medicinal use and since no standards could be drafted with which it might possibly comply, it is better out of the Pharmacopœia than in:—

	Per cent. Sb.		Per cent. Sb.
Eastern Sample	50·74	Theory, Sb_4O_6 contains	83·36
Western Sample	50.86	" Sb_2O_5 contains	75·02

Arsenic Trioxid.—The formula As_4O_6 which is used by some chemists, is based on the vapor density taken between 500° and 700° C., while at 1770° C. and above, the density corresponds to the old formula As_2O_3. The determination of the solubility of arsenous oxid is very unsatisfactory; aside from temperature, time plays the most important part; when macerated in water at 15° C. for one day, the solubility was 1 in 6122 parts of water; for two days, 1 in 4835 parts. Comey in his work on solubilities gives the following interesting table:—

		Crystalline.	Amorphous.
1 hour,	100 parts water dissolve	0·023	1·58
12 hours,	" " " "	0·360	3·36
24 hours,	" " " "	0·956	3.306
1 week,	" " " "	1·67	1.76
3 weeks,	" " " "	1·776	1·713
2¼ years,	" " " "	1·710	1·707

There are also great discrepancies if the determinations are carried out by the cooling of a hot saturated solution.

Aqua.—From the standpoint of the chemist, the framing of tests for the exclusion of sewage contamination from Aqua U.S.P., is a very unsatisfactory task. For at times it requires the highest skill on the part of the chemist to detect certain kinds of contamination by chemical tests, in fact a bacteriological examination is more to be relied on than the former. However, since it is the chief object of the Pharmacopœia to exclude such waters as are grossly contaminated, the revised tests will in careful hands accomplish this object.

Aqua Destillata.—The tests for ammonia were omitted, owing to the readiness with which this gas is taken up by distilled water when handled about the store. The presence of traces (more or less) of ammonia would have no bearing on the purity of distilled water anyhow.

Because of the solubility of the glass of containers in distilled water, we must permit the presence of soluble matter; this was not recognized in the last revision and caused hardships in the enforcement of our pharmacy laws.

This solubility of glass in water varies considerably, according to the nature of the glass, thus: 1000 c.c. of distilled water stored for one month in a green glass bottle gave a residue weighing 14 milligrammes; another like volume stored in an amber bottle gave 58 milligrammes of residue; still another sample of 1000 c.c. gave no weighable residue after storing for one month's time. One liter of distilled water when boiled for two hours in a Bohemian flask, took up only 20 milligrammes of residue, while American colorless chemical glass gave up 24 milligrammes of soluble matter under like conditions.

Ordinary water containing 75 milligrammes per liter can scarcely pass the U.S.P. tests for distilled water, hence such a substitution is not probable.

Arseni Iodidum.—The commercial impure article, prepared by fusing metallic arsenic and iodin together, is of variable iodin content, and in an unsatisfactory state for defining limits of purity. But if the pure compound be prepared by dissolving 10 c.c. of arsenous oxid in 250 c.c. of hot hydrochloric acid and pouring into a solution of 51 grammes of potassium iodid in 40 c.c. of warm

water and purifying by extracting the dry residue with chloroform or carbon disulfid, a very stable crystalline powder results. This is orange to red in color, according to the size of the crystals. The *same* product may be obtained on extracting the pulverized commercial article with chloroform or carbon disulfid or even water. Iodid of arsenic thus prepared does not lose weight after two hours' heating on a bath of boiling water; further heating at higher temperature causes the salt to sublime.

It is very singular why our manufacturers never attempted to improve the quality of this very potent salt. Presumably, because the retailers take what is given them.

The iodid thus prepared or purified, assays 83·07, 83·30, 83·88 per cent. iodin according to Volhard's method, and 83·36 per cent. gravimetrically. Theoretically, the compound should contain 83·54 per cent. of iodin.

Two arsenic determinations gave 16·32 and 16·47 per cent., while theoretically the compound should contain 16 46 per cent. of metallic arsenic.

I think that the limits of 83 per cent. of iodin and 16 per cent. of arsenic, corresponding to a 99 per cent. salt, are fair for all manufacturers, if they will only take the pains and extract the pure product from the fused mass (mess) they have heretofore furnished.

With such a product we can safely guarantee uniformity in the strength of Donovan's Solution.

Bromids.—Considering the quality of American bromin, it was deemed advisable not to raise the standard of the bromids and this was made uniformly 97 per cent. Higher grade bromids are readily obtainable at the same prices. The writer has found more low-grade sodium and especially ammonium bromids than those of the other bases.

Excessive alkalinity, which frequently occurs, has been provided against by a revised text. Many commercial samples examined showed an alkalinity exceeding Pharmacopœial limits, 1 gramme of KBr. requiring from 0·3 to 0·6 c.c. of decinormal acid V. S. Owing to the strictness of the old U.S.P. text regarding the presence of sulfates, it was necessary for manufacturers to remove these by means of barium bromid, hence the introduction of a test for the presence of barium. If the presence of sulfates in bromids and iodids of the alkalies and alkaline earths are ignored in the next revision, this test for barium may be dropped.

The test for iodids in bromids has been made more sensitive and reliable for general use by the method of agitating with a small volume of chloroform while adding diluted chlorin water drop by drop. The pale rose to faint violet coloration of 1 c.c. of chloroform produced by traces of iodin is readily and accurately distinguished before any blue with starch paste might be noted. The presence of 0·05 milligrammes of KI will impart a faint violet color to chloroform. This immiscible solvent chloroform is not so readily decolorized through an excess of chlorin water as an aqueous solution of iodized starch. Starch solution in the hands of the inexperienced, careless as to its freshness and proper preparation, is a very unreliable reagent for traces of iodin. While the presence of sulfates and chlorids may be ignored in the alkali salts, we must restrict them in such zinc salts as the bromid, iodid and valerate, which are given in fair-sized doses extending at times over greater periods. I have been assured from very reliable sources that zinc dross (waste from galvanizing iron) is largely used in the preparation of the various medicinal zinc salts, while the best grades of zinc oxid (98·5 to 99 per cent.) are demanded by the paint manufacturers.

The test limiting the chlorids in bromids and iodids of zinc to 0·1 per cent. is based on the fact that when a solution of lead bromid or iodid in acetic acid is evaporated, the two halogens are volatilized, leaving a chlorid behind which is identified in the usual manner.

Bromin.—Various samples of German bromin assayed 99 per cent. while that of Michigan origin was 98·5 per cent. Bromin from Western Pennsylvania and Ohio contained from 6 to 12 per cent. of chlorin.

[*To be continued.*]

OHIO BOARD OF PHARMACY.

NOTICE TO REGISTERED PHARMACISTS AND ASSISTANT PHARMACISTS IN THE STATE OF OHIO.

WHEREAS, Section 4410 of the Pharmacy Law confers upon the Board of Pharmacy authority to revoke the certificate of any person guilty of a felony, or gross immorality, or who is addicted to the liquor or drug habit to such a degree as to render him unfit to practice pharmacy.

And, further, the Attorney-General of Ohio in an opinion given to the Board of Pharmacy on July 21, 1905, held that the sale of

narcotic drugs, particularly cocaine and its derivatives or compounds, in violation of the statutes regulating the sale of such drugs constituted gross immorality within the meaning of a portion of Section 4410 of the Pharmacy Law, and that the Board of Pharmacy is justly entitled to revoke the certificate of any registered person found guilty in any court in the State of the unlawful sale of such narcotic drugs.

Therefore, this notice and warning is given to all registered pharmacists and assistant pharmacists of Ohio, that the Board of Pharmacy will hereafter proceed against every person whom the courts of the State have adjudged guilty of violating the laws regulating the sale of narcotic drugs for the revocation of certificates of registration in accordance with the power conferred by Section 4410 of the Ohio Pharmacy Law as interpreted by the Attorney-General of the State.

By order of the Board,

W. R. OGIER, *Secretary.*

COLUMBUS, O., October 13, 1905.

PHILADELPHIA COLLEGE OF PHARMACY.

The Quarterly Meeting of the Philadelphia College of Pharmacy was held June 25, 1906. President Howard B. French in the Chair.

Owing to the illness and consequent absence of the Secretary, Dr. Charles A. Weidemann, the Registrar was requested to act as Secretary *pro tem.*

The minutes of the Annual Meeting held March 26, 1906, were read and approved.

The minutes of the Board of Trustees were read and approved.

Following the report of the Historical Committee the Chair suggested that Mr. Wiegand be requested to write his recollections of the early Pharmacists of Philadelphia, which he consented to do.

The Committee on Necrology reported the death of the following active members: Dr. John Bley, Robert C. Brodie, Dr. Joseph P. Bolton, Henry Cramer, Edward T. Dobbins, Louis Koch, Allen Shryock, and a corresponding member, Dr. Carl Schacht, of Berlin. In connection with the above report the Chair read an abstract from

the will of the late Mr. Edward T. Dobbins establishing a scholarship in the College.

The Committee on Membership reported the standing of members and recommended that four members be dropped for non-payment of dues. The election of two active members was reported. Several men, prominent in pharmacy and botany, were proposed for honorary and corresponding memberships. The Committee recommended that each member of the College be requested to furnish a biographical sketch of himself, giving the most important data pertaining to his life and work, together with a photograph of himself.

Mr. Wm. McIntyre presented to the Publication Committee a set of bound volumes of the AMERICAN JOURNAL OF PHARMACY (Vols. 1850–1905) for which a vote of thanks was unanimously tendered.

The following resolution was unanimously adopted: The members of the Philadelphia College of Pharmacy note with sincere regret the absence of its efficient Secretary, Dr. C. A. Weidemann, who, it is learned, has been quite ill for some weeks past, and express the hope that he may rapidly regain his health and strength and soon be among us again.

APPOINTMENTS.

Delegates to the American Pharmaceutical Association: Joseph P. Remington, Henry Kraemer, Samuel P. Sadtler, Clement B. Lowe, and M. I. Wilbert. Alternates: M. N. Kline, E. M. Boring, Miers Busch, W. L. Cliffe, and J. W. England.

Committee on Nominations: W. A. Rumsey, J. M. Baer, Henry Kraemer, O. W. Osterlund, Wm. McIntyre.

Committee on Necrology: S. P. Sadtler, Henry Kraemer, and Gustavus Pile.

Historical Committee: G. M. Beringer, T. S. Wiegand, Henry Kraemer, M. I. Wilbert, and J. M. Baer.

ABSTRACTS FROM THE MINUTES OF THE BOARD OF TRUSTEES.

March 6, 1906.—The following resolution was adopted relative to the death of our late member, Edward Tomkin Dobbins, which took place the 17th day of February, 1906.

WHEREAS: Edward Tomkin Dobbins, a graduate and member of the Board of Trustees of the Philadelphia College of Pharmacy, passed from this life on the 17th day of February, 1906.

That the College by his death has lost a devoted and faithful friend, who testified by his many acts of kindness and thoughtfulness to young men employed in the drug business, his consistent belief in the value of a sound pharmaceutical education as well as his love for his Alma Mater.

Resolved: That the Board of Trustees of the Philadelphia College of Pharmacy attend the funeral of their deceased member, and that a copy of these resolutions be sent with expressions of sincere sympathy to his family.

Committee.
JOSEPH P. REMINGTON,
HOWARD B. FRENCH,
RICHARD M. SHOEMAKER.

April, 3, 1906.—The following officers for the ensuing year were elected: M. N. Kline, Chairman of the Board of Trustees; George M. Beringer, Vice Chairman of the Board of Trustees; Jacob S. Beetem, Registrar; and the Standing Committee for the year appointed.

The Committee on Instruction reported favorably upon electing Professor LaWall, Associate Professor of Theory and Practice of Pharmacy.

May 1, 1906.—Committee on Instruction recommended several important measures relating to improvement in the educational standing of the classes, which were adopted. The Treasurer presented a very favorable Annual Report.

May 11, 1906.—Committee on Examination presented their report recommending 111 students for the degree P.D., 5 students for the degree P.C., and 8 students for the Certificate of Proficiency in Chemistry, making a total of 124; also announced the prize winners. Committee on Instruction recommended that after this year no student of the first or second grade classes be permitted to take the Fall examination in any branch as a conditioned student, unless failure to submit an examination paper in the final examination is satisfactorily explained as due to an unavoidable cause. (Adopted.) Tickets for tuition, $16 each, but if paid for prior to November 15th at the rate of $15 each, thus allowing a rebate of $1 on each ticket. (Adopted.) Also recommended an Introductory Exercise for the First Year class, to be held September 27, 1906, at 3 P.M. in the College Auditorium, and to consist of addresses by the President

and members of the faculty. (Adopted.) Prof. Remington reminded the Board of Trustees that Mr. Wallace Procter had served as a member for the past twenty years; and moved that the Board place on record its high appreciation of his services as a member of the Board of Trustees and especially as Chairman of the Committee on Examinations. Unanimously carried.

J. S. Beetem,
Secretary pro tem.

AMERICAN PHARMACEUTICAL ASSOCIATION.

Provisional Program, September 3–8, 1906.

The following provisional program has been arranged for the meeting at Indianapolis :—

Monday, September 3, 10 A.M. Meeting of Council; 3 P.M. First General Session. The Nominating Committee will meet following adjournment of General Session.

Tuesday, September 4, 8.30 A.M. Reception; 10 A.M. Second General Session; 3 P.M. Session of the Section on Education and Legislation; 8 P.M. Session of Section on Commercial Interests.

Wednesday, September 5, 10 A.M. Session of Section on Education and Legislation; 3 P.M. Meeting of American Conference of Pharmaceutical Faculties; 3 P.M. Meeting of the National Association of Boards of Pharmacy; 8 P.M. Session on Scientific Papers, Lecture by Dr. H. H. Rusby.

Thursday, September 6, 10 A.M. Session of Section on Scientific Papers; 10 A.M. Session of Section on Commercial Interests; 3 P.M. Joint Conference of Faculties and Boards of Pharmacy; 8 P.M. Session of Section on Practical Pharmacy and Dispensing.

Friday, September 7, 10 A.M. Session of Section on Historical Pharmacy; 3 P.M. Session of Section on Practical Pharmacy and Dispensing; 3 P.M. Session of Section on Scientific Papers; 8 P.M. Installation of Officers; 9 P.M. Historical Pharmacy (Memorial Session).

Saturday, September 8, 9 A.M. Organization of the New Council; 10 A.M. Final General Session; 3 P.M. Meeting of the Council.

THE PHILADELPHIA BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The following letter has been sent out to pharmacists in the vicinity of Philadelphia, and it is to be hoped that a number of these will ally themselves with the Association and co-operate in extending the usefulness of the local branch :—

If you, as a pharmacist, are interested in the practice of pharmacy or are willing to assist in advancing the professional side of your calling, you should be interested in the work that is being done by The American Pharmaceutical Association and particularly the extension of that work through local branches.

If you do not know what the American Pharmaceutical Association is, what it has done or what it is doing to advance the profession of pharmacy, you should send to the Secretary of the local branch for literature.

If you do know what the American Pharmaceutical Association is and what it has done for you and for the practice of pharmacy in America, you should acknowledge your obligation by sending to the Secretary of the local branch for the necessary application blank.

If the work that has been done or is now being done by the American Pharmaceutical Association does not meet with your approval or if you are not willing to take part in developing the professional side of your calling, write to the Secretary of the local branch and tell him your reasons why the objects and aims of the American Pharmaceutical Association do no appeal to you. Your objections, if they are valid, will serve as suggestions for improving the work of the Association and will, therefore, be of benefit to all who are in any way interested in pharmacy.

M. I. WILBERT, *Secretary*,
2811 Diamond Street, Philadelphia, Pa.

AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES.

The American Conference of Pharmaceutical Faculties was organized at Richmond, Va., May 8, 1900, for the purpose of promoting the interests of pharmaceutical education. The organization has enjoyed a steady growth since that date, and to-day has twenty-six

schools and colleges of pharmacy on its membership list. The seventh annual meeting to be held at Indianapolis, Ind., September 5th, will be the most important in the history of the organization. The requirements for admission to the conference and for continued membership in the organization will be under consideration. With a view of raising the present standard, with the exception of the executive session, during which applicants for membership are considered, the meetings of the conference are open to all interested parties. Pharmaceutical educators and members of boards of pharmacy are particularly urged to be present at the opening session.

Proceedings of the 1905 meeting will be mailed upon application.

H. M. WHELPLEY, *President*
WILLIAM A. PUCKNER, *Chairman Executive Committee.*
J. O. SCHLOTTERBECK, *Secretary-Treasurer.*

NOTES AND NEWS.

AMERICAN PHARMACEUTICAL ASSOCIATION.—The interest in the Procter Monument continues, and the work of collecting the funds seems to have been fairly begun in various parts of the United States.

Frank Richardson, Treasurer of the New York State Pharmaceutical Association, reports that the Sub-committee of that Association has collected $268.20.

Prof. F. J. Wulling writes that the Minnesota State Pharmaceutical Association has appropriated $100.00 to the Procter Monument Fund, and that he individually will subscribe $10.00.

The members of the Pennsylvania Pharmaceutical Association have up to date subscribed $216.00. The following are the names of contributors not previously reported, together with the amount subscribed by each :—

George A. Gorgas	$ 5 00	William H. Smith & Co.	$ 5 00
D J. Thomas	10 00	Joseph L. Lemberger	10 00
W. L Cliffe	10 00	H. T. Waldner	1 00
Clement B Lowe	10 00	Henry J. Siegfried	10 00
William McIntyre	10 00	George W. Roland	2 00
Edwin M. Boring	5 00	Franklin M. Apple	5 00
William E. Lee	5 00	Henry C. Blair	5 00
L. L. Walton	5 00	Charles E. Vanderkleed	2 00
R. H. Lackey	5 00	Charles T. George	10 00
Mrs. Horace Lee	1 00	Miss M. A. Moffet	1 00

Thus far Prof. Henry Kraemer has received subscriptions from the members of the Philadelphia College of Pharmacy amounting to $354.50. The following are the names of contributors not previously reported :—

E. F. W. Garber	$ 3 00	Frank X. Moerk	$10 00
Samuel B. Kirk	10 00	Charles B. Fricke	3 00
F. F. Muller	2 50	C. W. Hancock	10 00

W. C. McPike, a member of the Kansas Pharmaceutical Association, has contributed $10.00 through Prof. L. E. Sayre.

CHARLES H. LAWALL, Instructor in Theory and Practice of Pharmacy, has been made Associate Professor of Pharmacy in the Philadelphia College of Pharmacy. He will give lectures in inorganic and organic pharmacy to the students of the second-year class. Professor LaWall has acted in the capacity of Instructor in Pharmacy since October, 1900. A few years ago he became associated with Professor Henry Leffmann in general analytical work. He has succeeded Dr. Leffmann in the ownership of the laboratory and in many details of the work and during the past two years has done much work in food adulteration, being frequently called upon to testify for the State Food and Dairy Commission as well as for others. He has been a frequent contributor to pharmaceutical and chemical literature and has written a number of papers on the detection of adulterations in foods and drugs.

A COLLECTION OF PLANT CONSTITUENTS, including alkaloids, glucosides, amaroids, sugars, starches, plant acids, coloring principles, fats, waxes, and some rare aromatic principles, has been presented to the New York botanical garden by E. Merck & Co., of Darmstadt and New York. The number of exhibits is between 400 and 500, comprising not only the most active medicinal principles, and other things for which uses are now known, but many things extracted from plants only experimentally, for scientific purposes, for which it is hoped uses may be developed in the future.

JACOB DINER, Secretary of the Metropolitan Association of Retail Druggists, of Greater New York, has been appointed a member of the National Executive Committee of the N.A.R.D., to fill the vacancy caused by the resignation of Thomas Vogeli of Minneapolis. Mr. Diner has shown himself to be alert as to the present needs in pharmacy and in his new office he will have a chance to give his abilities wider scope.

ARNE OLDBERG, son of Prof. Oscar Oldberg, and Professor of Music in Northwestern University, is engaged in composing the orchestral parts of an overture and completing the score of a symphony. A recently written theme and variations for full orchestra by Prof. Oldberg will be performed by the Theodore Thomas Orchestra next season.

THE AMERICAN
JOURNAL OF PHARMACY

SEPTEMBER, 1906.

RÉSUMÉ OF CRITICISMS OF THE U.S.P.

By M. I. Wilbert,
Apothecary at the German Hospital, Philadelphia.

To the pharmacist who is willing to assist in the progress of American pharmacy the recently published, and now official, eighth decennial revision of the Pharmacopœia of the United States of America must, even now, be second in interest and importance to the prospective ninth decennial revision that will be published by a committee on revision to be appointed at the National Convention for Revising the Pharmacopœia, to be held in the city of Washington, in May, 1910.

To make this prospective Pharmacopœia even more representative of the ideas, ideals and practices that dominate the practice of pharmacy in this country at the time, should be the ambition of every active member of the profession for whom the Pharmacopœia is more directly intended as a text-book and guide.

To do this, and to do it at all satisfactorily, it will be necessary that every page, every monograph, and even every line of text in the present Pharmacopœia be subjected to a critical examination with a view of finding errors or discrepancies in the theories and supposed facts therein presented.

To direct, and if possible aid in, the observation and study of these possible shortcomings, it is proposed to publish from time to time, as material and space permit, extracts from criticisms of the Pharmacopœia and pharmacopœial matter published elsewhere.

While commendatory notices of a book of the nature of a pharmacopœia must necessarily be justly numerous, and in many respects interesting, they have little or no use in fostering a spirit of critical

inquiry, and they will, therefore, but seldom find reflection in these pages unless they have a direct bearing on some subject immediately under discussion. It should be borne in mind also that the criticisms that will be presented do not necessarily bear the endorsement of the compiler, the editor of the JOURNAL, or of any member of the Publication Committee, and that they are presented here merely as "food for thought, suggestions for observation, and material for research and study."

PRESENT METHOD OF REVISING THE PHARMACOPŒIA UNSATISFACTORY.

That the present method of revision cannot give satisfaction is apparent, most of all to those entrusted with the task. Work done mostly by correspondence, often by members a thousand miles apart, has its insurmountable difficulties in spite of rapid mail service, telegraph and telephone.

What is needed is a central research laboratory to which the subcommittees may be delegated for certain periods, with a proper succession prearranged; such a laboratory need not be large, but should be supplied with everything necessary for research, especially a good working library. Work that has required several years, with its almost inevitable misunderstanding at the very end, might be done in almost as many months.

Another need is greater publicity in order that the bulk of criticism may be brought out before the book is published rather than after. (E. K., in *Pharmaceutical Review*, 1905, page 261.)

THE USE OF THE PHARMACOPŒIA.

The fact that the Pharmacopœia is a legal guide in so many States makes its neglect rather a serious matter for a great many druggists, and none knows in advance just how the serious aspect of such neglect is likely to first appear.

Though the Pharmacopœia has for many years been for the pharmacist the most important book that he could own, it has, unfortunately, turned out to be the one book that multitudes of them have thought they could best get along without. True, they have had it served up to them in divided doses by the various commentaries, but as a working manual the original book is far superior to the larger commentaries upon it, both as to its size—being much less bulky—and in the clearer presentation of the formulas in bold type

and with a freedom from mingling of lines which renders some of the subsidiary works unsuitable for the busy laboratory worker. It may also be said that as judges and attorneys come to know more about the pharmacopœia and its functions, decisions will be rendered upon what it says and not upon what the dispensatories say that it says. We can unhesitatingly recommend the new book to all readers of the *Circular* as being a work which it is of supreme importance to them that they possess if they really desire to conduct their business in a manner befitting modern times. It is a product that every pharmacist can be proud of, since it not only will compare favorably with every other pharmacopœia in the world, but an unbiased judgment of its merits will compel the decision that it leads all others. (*The Drug. Circ.*, 1905, p. 263.)

THE USE OF THE PHARMACOPŒIA BY PHYSICIANS.

It has been a standing reproval to the medical profession in general that they have taken little interest in this important work, but fortunately this is fast becoming a matter of history, and the time, we hope, may not be far distant when the Pharmacopœia will be a living part of every practitioner's armamentarium. The flagrant features of the patent medicine evil, so far as it is fostered by the physician himself, will cease to exist when he is better acquainted with this book. (*Medical News*, August 19, 1905, p. 360.)

THE LATIN OF THE U.S.P.

The new Latin of the U. S. Pharmacopœia is necessarily one of the first features to strike the reader. There are many eminent philologists in America, and the Pharmacopœia revisers have probably had the advice of some of these, so that it will not be safe to be too keenly critical, but " fluidextractum " can hardly be Augustan. We may expect " Unitedstatesum " next. A single word to represent the class of galenicals is perhaps a desideratum, but the nation which has invented " vaseline," "tabloid " and " liquozone " need not have been floored by such a simple problem.

"Emulsum" for "emulsio" may or may not be quite new just now; it is at all events a regrettable change. "Emulsio" was a medical Latin substantive, coined in orthodox fashion from the verb

emulgere, to milk out, past participle *emulsus*. It was first used to describe the milk of almonds, milked out from the blanched almonds. In what respect "*emulsio*" is not satisfactory does not appear.

With antipyrine recognized it is not easy to see why sulphonal and trional should not have been Latinized more simply than under the pedantic barbarisms of "sulphonmethanum" and "sulphonethylmethanum. "Manganum" is better than "manganesium," especially because it more clearly distinguishes the element from magnesium; but the abbreviation of ipecacuanha to "ipecac," common and convenient as it is in commerce and conversation, ought not to be encouraged in a book of authority for historic reasons. (Xrayser, in *Chem. and Drug.*, 1905, p. 89.)

OBJECTIONS TO WEIGHTS AND MEASURES.

As in the last revision the metric system of weights and measures is used exclusively, except where doses are concerned, and while this is all right from a scientific point of view, the universal adoption of the metric system in this country is still a long way off, and the instructions of the convention tend to limit the usefulness of the Pharmacopœia. We predict that the next revision will include alternative weights and measures, which the pharmacists have for some years been demanding. In the preface are given approximate measures which should be used to designate doses of liquid medicines. A teaspoonful is equivalent to 4 c.c. or 1 fluid drachm, a dessertspoonful to 8 c.c. or 2 fluid drachms, and a tablespoonful to 16 c.c. or 4 fluid drachms. The almost universal practice to-day is to make 5 c.c. the equivalent of one teaspoonful. (*Drug Topics*, 1905, page 229.)

USE OF METRIC SYSTEM COMMENDED.

Opposition to the metric system still exists, and its use is felt by many to entail a great deal of vexation; but the consensus of opinion among scientific men the world over is overwhelmingly in its favor, and while its general use may be delayed until the present generation of physicians and druggists shall pass away, it is sure to prevail in the end. Let us help along the good work if we can, or at least let us not hinder it. (Dr. John M. Francis, in *Bulletin of Pharmacy*, 1905, page 275.)

APPROXIMATE MEASURES OBJECTED TO.

A point of doubtful propriety is the sanctioning of the use of the teaspoonful, dessertspoonful and tablespoonful as 1, 2 and 4 fluid drachms and 4 c.c., 8 c.c. and 16 c.c. respectively. Though commonly used, the remarkable inequality in the size of these containers is too well known to require further comment. (*Am. Med.*, Aug. 19, 1905, page 295.)

POSSIBLE DANGER IN ASSAY PROCESSES.

The assaying of oil of rosemary for the percentage of borneol may be an exceedingly simple task for some pharmacists, but we doubt if many of them are able to manage reflux condensers, acetilization flasks, etc., or would know how to determine whether the first fractional distillate were dextro- or levo-gyrate. Evidently, the average druggist cannot follow such assay processes for essential oils, nor, if he could, would such ability be of much use to him. He does not make his own essential oils and seldom buys them in large enough quantities to make the assays, except under legal compulsion, profitable. However, it may be possible that the fact that such processes are given in the Pharmacopœia will make dairy and food chemists think that druggists ought to know all about them and ought to test their essential oils in the way indicated. On discovering that such is not the case, it is conceivable that some of them may make this an excuse for trying to force the care of drugs out of the hands of boards of pharmacy and into those of food commissioners. This is but a conjecture, it is true, but the ancient rights and privileges of druggists are being crowded upon so hard of late that we should guard them at all possible points of attack. On the other hand, it might be said that if the druggist did not take the initiative in establishing standards and tests, they would be regarded as derelict to their duty, and agricultural departments would have another excuse for further encroach upon their grounds. (*The Drug. Circ.*, 1905, p. 263.)

ASSAY PROCESSES COMMENDED.

The most striking innovation in the new Pharmacopœia is the increased number of assays demanded; assays not only of crude drugs, fluid extracts and tinctures, but also of essential oils. It has long een a source of astonishment that these were not demanded before,

for it is only by means of them that uniformity of strength in pharmaceuticals can be obtained. Heretofore there has been no reason why a fluid extract of jaborandi, for example, of one manufacture, should not contain four or six times as much pilocarpine as that of another. Again, it is only by determining the amount of menthol or santalol present in oil of peppermint and oil of sandalwood that the purity of such oils can be established, because the methods of adulteration and sophistication are to-day so refined that oil of peppermint, for example, can be dementholized and still meet practically all of the physical requirements of a pure oil. The methods of assay are so simple that they can be carried out without any difficulty by any retail druggist who has had the chemical training which most colleges of pharmacy claim to give. It is lamentable that the retail druggist does not make more use of his pharmaceutical-chemical training than he does. Incidentally it may be remarked that the assays of the new Pharmacopœia should find a place for treatment in the curriculum of every college of pharmacy, and familiarity with them should be demanded of all candidates by boards of pharmacy. What moral right has a man to dispense preparations whose strength he is unable to determine? (Charles E. Caspari, in *Meyer Brothers' Druggist*, 1905, p. 248.)

ASSAY OF ACONITE SAID TO BE FAULTY.

Aconite is one of the instances where the Committee on Revision has carried the instructions to include assay processes, where possible, to an extreme. In the first place, we doubt whether aconite root is obtainable commercially that will yield 0·5 per cent. of aconitine melting at 195° C. The highest average yield of total alkaloid is 1 per cent., reported by Keller from dry German root, but his results have not been confirmed by other investigators. An average yield of total alkaloid from good commercial root is 0·5 per cent., and quite a percentage of this is certainly not aconitine. Moreover, the official process of assay will not extract aconitine alone; other alkaloidal substances will contaminate the final residue. If the committee had fixed the strength at 0·5 per cent. of total alkaloids, little criticism would have been aroused. In any event much more research is needed before a satisfactory assay of aconite is possible. No assay is worth anything that does not determine the aconitine. (*Drug Topics*, 1905, page 210.)

DISCREPANCY IN DOSE OF PREPARATIONS OF ACONITE.

The standard adopted for aconite root appears surprisingly high, and when the dose of aconitine and the dose of the fluid extract of aconite are compared, the surprise is not lessened. The "average" dose of the alkaloid is $\frac{1}{400}$ grain, and that of the fluid extract is 1 minim, equal to $\frac{1}{300}$ grain, which apparently is too high; in fact, according to notions of dosage in this country for aconite, is excessive. The tincture is still further out, the "average dose," 10 minims, being equal to $\frac{1}{266}$ of a grain of aconitine. (Thos. Maben, "Standardization in the New U.S.P.," *Pharm. Jour.*, 1905, page 140.)

ASSAYED ESSENTIAL OILS.

After September 1st, it will be advisable for druggists when selling essential oils to ask whether the oil is required for medicinal purposes, in view of the fact that, whenever possible, essential oils are required to reach a certain standard, and a process of assay is appended. Time alone will show whether the committee has acted wisely in fixing such rigid requirements for this class of products. Certain it is that sooner or later some hypercritical health official or dairy commissioner will conduct a campaign similar to that waged in this city a short time ago on the acetophenetedin subject. In any event it would seem a little premature for methods of assay to be placed in the Pharmacopœia which can only be carried out by skilled analysts, and which are of so recent date that few pharmacists in retail business have ever heard of them, least of all tried them practically. (*Drug Topics*, 1905, page 215.)

MONOGRAPHS ON ESSENTIAL OILS COMMENDED.

Viewed all round, there can be no question that the monographs are in themselves models of what such monographs intended for guidance in medicine should be, and, in our opinion, they go very decidedly further, and are likely to be of great value to all manufacturing pharmacists, and also to those who may handle essential oils, and record the principal features in a concise form for judging purity and value. (J. C. Umney and C. T. Bennett, "The Essential Oils of the U.S.P.," *Pharm. Jour.*, 1905, page 144.)

LISTS OF PREPARATIONS MISSED.

A change that will be noted especially by physicians and students, but also by pharmacists, is the omission of the lists of preparations of the various drugs. In a sense these are relatively unimportant, but we believe the majority of the physicians would vote for their restoration. (*Am. Med.*, August 19, 1905, page 295.)

A USELESS PREPARATION OF STAPHISAGRIA.

There is a notable exception to the excellence of the pharmacy of the book in the case of staphisàgria. Though that drug is now rarely employed internally, to the best of our information, the only preparation of it authorized is a fluid extract, the average dose of which is given as 1 minim. We venture to say that staphisagria will continue to be used chiefly as a parasiticide, and that the fluid extract will not be found an eligible preparation for that purpose. (*New York Med. Jour.*, August 5, 1905, page 286.)

OBJECTIONS TO SOME OF THE NEW ADDITIONS.

Acid Camphoric.—Presumably introduced out of deference to German opinion, as it is not very extensively used here.

Acid Trichloracetic.—Much used as a test reagent for albumen and as a topical application, but there does not seem to be any special reason for including it in the Pharmacopœia.

Æthyl Carbamate.—More familiar under the name of Urethane. Its inclusion comes as a surprise, for it is rapidly falling into disuse.

Cataplasma Kaolina.—The modern substitute for the old-fashioned flaxseed poultice. Its introduction comes as a surprise, as the use of these clay poultices has occasioned much criticism, and is by some considered as a distinct retrograde step in modern therapeutics. The commercial kaolin, which constitutes the basis of this compound, makes a nasty, dirty-looking mass, and the official product might have had more glycerin added with advantage. It is too stiff.

Ceratum Resinæ Comp.—A resurrection of the old Deshler's salve, official in the 1870 Pharmacopœia, which might have been allowed to rest in peace. It is hardly a fit representative of twentieth century pharmacy.

Chloralformamidum—The chemical term for chloralamide. More

prescribed on the continent of Europe than in the United States, where its use is decreasing. The dose is placed at 15 grains.

Cresol.—Described as a mixture of the three isomeric cresols, free from phenol, hydrocarbons and water. Difficult to obtain of good quality in this market.

Elixirs.—The new Elixir Adjuvans is simply a mixture of fluid extract of licorice and aromatic elixir, and makes a fairly palatable liquid, but we should have preferred to see the old N. F. Elixir Adjuvans introduced without change, as the latter served admirably the purpose for which it was designed. The other newcomer is the popular elixir of iron, quinine and strychnine phosphates, but the official instructions for manufacturing the preparation are unnecessarily complicated.

Fluidextracta.—The new name for the old extracta fluida, and one which will not appeal to purists in nomenclature.

Guaiacolis Carbonas.—Another tribute to the ingenuity of German chemists. Largely prescribed, but in reality a much overrated compound therapeutically.

Hydrastina.—The white alkaloid of hydrastis, melting at 131° C. Supposed to represent the activity of the drug, but has not been found as useful.

Iodol.—A surprising addition. Was never popular, and has long since been discarded by surgeons in favor of other iodine compounds.

Liquor Antisepticus.—The Pharmacopœia equivalent of the popular "Listerine," which, however, it does not resemble very closely. It does not seem to us that the Pharmacopœia is just the place for imitations of what are really toilet and not medicinal articles.

Pelletierinæ Tannas.—Rather a surprising addition, in view of the fact that little is known of its true composition, and also that about its only use is for the expulsion of tapeworm.

Vanillinum is rather a strange addition, as it has no medicinal use and does not enter into any pharmacopœial product. Both the natural and artificial products are recognized, and a test is given to ensure absence of acetanilide, a frequent adulterant.

Vinum Cocæ.—This is the only new wine, and for this thanks to the enterprise of Mariani & Co. It is prepared from fluid extract of coca, and therefore contains cocaine, which is claimed not to exist in the advertised article. Alcohol, sugar and

red wine make up the balance of the mixture. The addition of sugar is not only unnecessary, but objectionable, and the introduction of the product cannot be commended either on pharmaceutical, medical or ethical grounds. (Extracts from *Drug Topics*, 1905, pages 195–199.)

OPINIONS ON THE USE OF ACETONE IN MAKING OLEORESINS.

In the preparation of most official oleoresins acetone now replaces ether. It is peculiar in that it combines in itself the solvent powers of both alcohol and sulphuric ether, so that it extracts from many drugs substances soluble in ether and insoluble (to a greater or less degree) in alcohol, and also substances soluble in alcohol but insoluble in ether. As a result, most and perhaps all of the official oleoresins will, on standing, separate into a heavy portion corresponding in a measure to an alcoholic extract insoluble in ether, and a lighter portion insoluble in alcohol, soluble in ether, and corresponding in quality and quantity to the usual ether-extracted oleoresin. (Dr. John M. Francis, in *Bull. of Pharm.*, 1905, page 317.)

Acetone is used as the solvent for making all of the oleoresins with the exception of cubeb oleoresin, which is prepared with alcohol. Manufacturers have long since seen the folly of using an expensive solvent like ether, and the adoption of acetone as a solvent is a recognition of commercial pharmaceutical advances. (*Drug Topics*, 1905, page 214.)

SPECIFICATIONS FOR ALOIN TOO RIGID.

We feel obliged to take exception to the specifications for Curacao aloin, viz.: "Soluble in about 65 parts of water, 10·75 parts of alcohol, 664 parts of ether, . . . and 21 parts of acetone;" a melting-point, after having been dried over sulphuric acid, of "about 147° C.;" "when ignited, is consumed without leaving a residue."

The above, which seems to be taken from Hager, or some similar authority, must be based upon an almost chemically pure article; it most certainly is not based upon such aloin as is generally used, and of which tons are sold annually in the United States. We find that the standard grades of commercial aloin have a melting-point of 130° to 142° C., and that on incineration they leave ash in amounts from 0·10 to 0·40 per cent. Furthermore, their solubility in water

and in alcohol does not even approximate the figures given. The specifications given in the "Pharmacopedia" of White and Humphrey are much nearer the truth: "They (crystals of aloin) are sparingly soluble in cold water (1 in 400), more soluble in 90 per cent. alcohol (1 in 18) freely soluble in hot water or (hot) alcohol, but nearly insoluble in ether." Of course, as the term aloin is not officially restricted to Curacao aloin, the pharmacopœial restrictions for this particular variety are practically non-operative for aloin as a class, and therefore of no practical value, but we regard their inclusion at all as questionable, because they are supposed to have some practical bearing on official aloins and are liable to cause confusion. (Dr. J. M. Francis, in *Bull. of Phar.*, 1905, page 319.)

TESTS FOR AMYL NITRITE UNSATISFACTORY.

A considerable proportion of the amyl nitrite on the market is of an inferior grade, and some of it, from reputable manufacturers, is not only worthless, but absolutely a source of danger because of its lack of genuine amyl nitrite. The specifications of the new Pharmacopœia are quite elaborate, much more so than in any other authority, but unfortunately they will admit a very poor, in fact almost a spurious, article. The assay by measurement of nitrogen produced is not sufficient, as we have in our possession samples which meet the assay requirements, but which, on fractionation, prove to contain very little amyl nitrite. The specification that "it boils at about 96° to 99° C." will not suffice if this means that, in common acceptance, it begins to boil at this temperature. If this statement is construed to mean that the liquid shall practically all distil at between 96° and 99° C., it becomes a greater measure of safety; though this is not sufficient to distinguish genuine amyl nitrite, and even if it were, it is too stringent. The safe and reasonable plan is to demand that the liquid shall assay at least 80 per cent. by the process given, and, at the same time, 80 per cent. or more of the total volume shall distil over between 90° and 100° C. Neither test is sufficient in itself, but together, in conjunction with the tests for free acid, water and aldehyde, will insure a high-grade commercial article. Pharmacists will, of course, remember that amyl nitrite decomposes readily on exposure, and will hence keep their stock at a minimum. (Dr. J. M. Francis, in *Bull. of Phar.*, 1905, page 319.)

GUTZEIT TEST FOR ARSENIC ENDORSED.

The greatest improvement is the fixing of a limit of impurity for arsenic and heavy metals. The maximum amount allowable is 1 in 100,000, a limit which makers should have no trouble in reaching. Hence the introduction of special tests for this purpose. The old Bettendorf test for arsenic, which answered fairly well, has been discarded in favor of the modified Gutzeit test, which is easier to apply and gives more consistent indications. (*Drug Topics*, 1905, page 230.)

TEST FOR ARSENIC TOO DELICATE.

The modified Gutzeit's test for arsenic is in many cases entirely too rigid. In the first place, it is difficult to obtain reagents which, by this test, will not show the presence of arsenic, and, in the second place, many official chemicals should be permitted to contain more arsenic than is represented by the proportion 1 to 100,000, which is the least permissible quantity of arsenic allowed by the new Pharmacopœia. (Chas. E. Caspari, *Meyer Bros'. Drug.*)

DETERMINATION OF CHLORIDES IN BROMIDES DIFFICULT.

Attention should also be called to the extremely unsatisfactory method retained in the new Pharmacopœia for determining the percentage of chlorides in bromides. By the present official method only the most careful and experienced analytical chemist can hope to obtain accurate results, and even he will frequently make an error amounting to 25 per cent. of the actual amount of chloride present. If the chloride must be titrated with the bromide by means of a silver solution, then it is much more accurate to add an excess of the silver nitrate and determine the excess by means of a standard sulphocyanide solution, because the end point in this case is much more easily recognized than when potassium chromate is used as an indicator. By far the best method of making the determination consists in treating the mixture of chloride and bromide in acid solution with some oxidizing agent, such as ammonium persulphate or lead peroxide, which will oxidize the hydrobromic acid, but which will not affect the hydrochloric acid, which, after the removal of all bromine, can be titrated with silver solution. The latter method can be carried out just as expeditiously as the present

official method, with very much less chance of error, and it requires only about a half-hour for the entire determination. (Charles E. Caspari, in *Meyer Bros'. Drug.*, 1905, page 249.)

DIRECTIONS FOR DETERMINING MELTING-POINT ARE MISSED.

Among the things not found in the U.S.P. are directions for determining the melting-point of various substances. This determination of the melting-point is, in the majority of cases, such a satisfactory evidence of the identity and purity of a chemical that all other tests may frequently be omitted.

The German Pharmacopœia devotes considerable amount of space to a description of how the melting-point is to be determined, and further defines the melting-point as that degree of heat at which the opaque substance melts down to transparent drops. (Otto Herting, in *D. A. Apoth. Zeitg.*, 1905, page 71.)

MELTING-POINT FOR STEARIC ACID SHOULD BE HIGHER.

The commercial stearic acid is practically the only kind that is of interest to the pharmacist, and the Pharmacopœia specifies a melting-point of not lower than 56° C. According to Brannt ("Animal and Vegetable Fats and Oils," Vol. I, page 148) this melting-point corresponds to a mixture of 60 per cent. palmitic acid and 40 per cent. stearic acid, the former being, from the source and process of manufacture, the substance that is naturally present in addition to the stearic acid. A very large proportion of the commercial article has a lower melting-point than 56° C., and it should be remembered that a difference of 2° or 3° produces a marked effect upon the consistence of glycerin suppositories; where an acid of 54° C. melting-pointing is used, the resulting base is too soft, and does not hold glycerin well at ordinary temperatures. It will repay the slightly increased cost to specify "stearic acid extra," having a melting-point of 58° C. (Dr. J. M. Francis, in *Bull. of Phar.*, 1905, page 317.)

ABSTRACTS FROM THESES ON CHEMICAL SUBJECTS.[1]

By J. W. Ehman.

In the examination of six samples of official *Magnesium Carbonate* G. S. DuBois obtained the following data: Loss on ignition ranging from 38·45 per cent. to 45·2 per cent., the average being 41·77 per cent. Carbon dioxide ranging from 33·7 per cent. to 37·2 per cent., the average being 35·89 per cent.

The sample giving the smallest percentage of residue and carbon dioxide was most nearly free from impurities, showing only a faint trace of iron.

W. S. Thompson experimented with the cold process for the preparation of *Solution of Lead Subacetate*, which he states is used by many pharmacists. The process consists simply in macerating lead oxide in a solution of lead acetate during a period of two weeks or more and decanting the clear solution.

The best result obtained was a preparation assaying only 20·712 per cent. lead acetate after macerating but twenty-four hours. Other samples macerated a much longer time gave still lower results.

S. E. Thorley compares the quality of *Ammonia Water* obtained from drug stores with that obtained from groceries and department stores.

Two drug-store samples assayed 7·534 per cent. and 9·287 per cent. of ammonia gas.

Three samples from department stores assayed 3·236 per cent., 6·572 per cent. and 12·8 per cent. ammonia gas.

Three samples from groceries assayed 1·837 per cent., 2·025 per cent. and 8·399 per cent. ammonia gas.

The department-store sample assaying 12·8 per cent. ammonia gas was found to be the only one containing more than traces of impurities, such as solid residue on evaporation and carbonate.

Of nine sample of *Sodium Phosphate* examined by C. C. Shomo:

One gave test for iron.

Five gave slight test for arsenic.

One gave decided test for arsenic.

Eight gave test for calcium.

Six gave slight test for chlorides.

---

[1] The experimental work embodied in these theses was performed in the Chemical Laboratory of the Philadelphia College of Pharmacy.

All gave test for traces of sulphates, none contained the full amount of water of crystallization, the highest being 51·7 per cent. and the lowest 20·1 per cent., the average being 39·5 per cent. as against 60·3 per cent. required for the crystallized salt. One sample thus contained more than twice the amount of sodium phosphate required by the U.S.P.

F. A. Butter finds in seven samples of *Boric Acid* a purity of 92·39 to 98·47 per cent., the average being 94·82 per cent.; traces of sulphuric acid were found in three samples.

Four samples of borax assayed from 88·12 per cent. to 98·03 per cent., the average being 91·83 per cent.

H. Seidman finds great variations in the strength of *Diluted Acetic Acid* obtained from both wholesale and retail sources.

Three samples from wholesale stores assayed 8·25 per cent., 10·44 per cent. and 13·09 per cent.

Three samples from retail stores assayed 5·25 per cent., 5·83 per cent. and 11·04 per cent.

None of the six samples showed more than traces of impurities.

ABSTRACTS FROM THESES ON PHARMACEUTICAL SUBJECTS.[1]

BY E. FULLERTON COOK.

Suppositories. By William W. Foster, Jr.—The author conducted a series of experiments to determine the value of various substances used in the moulding of cacao-butter-base suppositories, to prevent the adherence of the cooled suppository, and its subsequent cracking, when removed by force.

He used a formula in the tests which required special care to prevent the separation of a vegetable extract, owing to the presence of tannin; this particular suppository having caused considerable difficulty by sticking to the moulds and breaking when they are opened. The methods experimented with to prevent the difficulty were the dusting of the dried and clean moulds with lycopodium and with corn starch; also coating the moulds with liquid petro-

[1] The experimental work embodied in these theses was performed for the most part in the Pharmaceutical Laboratory of the Philadelphia College of Pharmacy.

latum and with a 4 per cent. alcoholic solution of castile soap; the latter being thinly spread upon the inner surface of the moulds with a piece of absorbent cotton before cooling. By the time they are ready to use, the evaporation of the alcohol leaves a thin coating of soap.

He also tried the use of clean, dry, unscratched moulds, well cooled, without other aid in the removing than the thorough cooling of the suppository.

He concludes that the latter method is the most simple and entirely satisfactory if the moulds are in good condition.

If they are injured by scratches the use of solution of soap is the best of the other methods, and seems to be without objection. Neither of the powders are very satisfactory if the moulds are in bad condition, and, being otherwise unnecessary, are of little value.

The Aromatic Medicated Waters. By Franklin W. Earl.—Experiments were made with the official (U.S.P., 8th Rev.) processes and also the British processes for the preparation of the aromatic waters to determine the relative worth or merit of the several methods.

In concluding the author says: "The hot water agitation method is the best, in that the water does not change on keeping and the process produces a saturated solution, and one which is clear and requires less time for preparation than other processes." Cinnamon water cannot be made by this method, however, as a turbid liquid results at once which will not clear.

In using purified talc he has found difficulty in freeing the water from the fine, suspended particles of talc which cannot be filtered out. The paper pulp is unpleasant to handle and does not seem to yield as strong a solution. Distillation with oils invariably yields a supersaturated milky liquid which must be filtered through a wetted filter, the resulting water having no seeming advantage over the agitation process.

The flavor, when distilled from the drug, as is directed in a number of British formulas, is finer, but the water is not transparent and requires refiltering. He suggests that the waters be made in larger stock containers, an excess of oil being allowed to remain in contact with the water and the shelf bottles filled from this, as needed, by filtering through a well-wetted filter.

Mistura Glycyrrhizæ Composita (*Brown Mixture*). By Frances R. Bell.—After a number of experiments with proposed formulas, pub-

lished during the last few years, which are intended to produce a clear preparation, free from the precipitate common in the well-known Brown Mixture of the average drug store, the writer concludes that if the official "pure extract of glycyrrhiza" is used as is directed, which is almost entirely soluble in water, the U.S.P. formula affords a more satisfactory preparation, in point of flavor, as well as appearance, than any of the proposed formulas.

The commercial "powdered extract of licorice," is not nearly so soluble as the "pure extract," and because of its large use in this preparation has caused the dissatisfaction. One sample of this commercial extract proved, upon examination, to be soluble only to the extent of 40 per cent.

Cataplasma Kaolini. By Herbert L. Flack.—The writer obtained a number of samples of kaolin from reliable sources and made them into cataplasm of kaolin by the U.S.P. (8th Rev.) formula, to determine if it could be relied upon, without modification, for all commercial grades of kaolin. He concludes that different samples of kaolin possess different absorbent properties, and that this quality of kaolin make it imperative that some modification, as to the amount of glycerin to be used in the formula, should be allowed. This result is further verified by similar statements from two large manufacturers of these preparations.

He also states that the preparation should be kept warm and occasionally stirred during at least four hours; otherwise a slow effervescence occurs in many samples, which renders it unfit to dispense in tight containers.

The suggested heating brings about a reaction, with small amount of carbonates which may be present and prevents further trouble.

He also recommends the addition of about 5 per cent. more of glycerin to the U.S.P. formula as being more generally satisfactory.

Glycerinated Gelatin Suppositories. By Elmer E. Scatchard.—A practical addition to the U.S.P. (8th Rev.) process for the making of glycerinated gelatin is here recommended. Instead of allowing the mass to cool in the dish, from which it is removed with considerable difficulty, he suggests that it be poured upon glass plates, slightly oiled with liquid petrolatum, and there allowed to cool. It may be removed from the plate without difficulty and cut into pieces for preservation, in the stock bottles.

He finds the following general formula to be most satisfactory. Slight modification will be needed to make these general directions applicable to all cases:—

Medicinal substance, a sufficient quantity; glycerinated gelatin, 3.5 grammes; glycerin, 2.5 grammes; water, 1 gramme.

Dissolve the medicinal substance in the water in a warmed mortar, if it is soluble, or triturate it thoroughly. Add the glycerin and then the melted glycerinated gelatin. Mix thoroughly, and pour into suitable moulds. The use of water alone to dissolve the medicinal substance and dilute the base is not desirable as subsequent evaporation occurs; the suppository shrinking to half its original size in a week.

The original paper includes a number of practical formulas as well as details for their successful use.

Elixir Ferri, Quininæ et Strychninæ Phosphatum. By Harry C. Hughes.—The formula for this elixir, introduced for the first time into the U.S.P. (8th Rev.), has been recommended by many who have used it, since published some years ago, yet almost every pharmacist can bear testimony to having had difficulty, at some time, with this preparation. One of the objections to the formula lies in the use of ammonia to neutralize the elixir; this being volatile is partially volatilized before the elixir has been kept for any length of time and the trouble begins. The experiments of the author have led him to suggest a slightly acid elixir, which is more permanent as to color and more free from likelihood of precipitation. Instead of neutralizing with ammonia water at the end of the process, as is directed in the U.S.P., he allows it to remain slightly acid and says: "It is miscible in all proportions with water and will keep well."

THE PROCTER MEMORIAL.[1]

BY HENRY KRAEMER.

My interest in the movement to memorialize the life and work of Prof. William Procter, Jr., dates from the Put-in-Bay meeting of the American Pharmaceutical Association in 1899. When we were on the boat going to Cleveland, Mr. Ebert came up to me and said:

[1] Read at the annual meeting of the Pennsylvania Pharmaceutical Association, June, 1906.

"Kraemer, I have something on my mind that I want to tell you and have you think about. Several years ago, when Professor Trimble was alive, I mentioned to him the fact that the younger generation were forgetting the great work that was done for American pharmacy by Professor Procter, and said that I hoped something could be done to revive his memory. Trimble is gone, and I thought I would speak of this to you as his successor on the AMERICAN JOURNAL OF PHARMACY where Procter did so much of his best work."

Since that time I have taken special pains to look into the career of Professor Procter and find that in addition to his accomplishments as the most representative American pharmacist of his time, he was universally esteemed not only by his associates and colleagues but by all those who came in contact with him. His claim to rank as one of the most representative pharmacists that America has yet produced, rests upon these things: He was a retail pharmacist, a teacher of pharmacy, an investigator and writer on pharmaceutical subjects, editor of a pharmaceutical journal, one of the founders of the American Pharmaceutical Association, member of the Revision Committee of the U. S. Pharmacopœia, and author of text-books on pharmacy. At the time of his death, in 1874, it was said of him that "For a period of thirty-seven years his labors had aimed at raising the status of pharmacy, and have been of such importance and lasting value that the deceased may justly be regarded as the father of American pharmacy."

This was the estimate of him at the time of his death, and after the lapse of thirty years this sentiment still survives. We need not wonder then that a movement has been started to memorialize Procter and the ideals for which he stood. There is no profession, science or art but what is imbued with certain ideals and standards of attainment and sooner or later gives concrete expression to them. It ought then to be a source of gratification to the pharmacists of this country to engage in an undertaking which will perpetuate the ideals of one of their great leaders.

Happily there has never been any question as to the desirability of honoring Procter. There has, however, been considerable discussion as to the form which the memorial should take. After considering the matter in all its bearings, the erection of a bronze statue of Procter in the Smithsonian grounds at Washington has been decided upon as the most feasible under present conditions. This

decision I consider rather fortunate, as the unveiling of a monument with its attendant ceremonies will not only help the members of our profession but would also attract the attention of the public in such a way as to cause them to take a more active interest in furnishing means for the development of pharmacy. Monuments take rank as among the best educational influences of the civilized world, symbolizing as they do the best that has been achieved. They not only embody and preserve man's noblest ideals and highest purposes but also inspire and encourage the humblest to persevere in spite of all conditions and circumstances. I doubt not that the standards of pharmacy will be raised in this country by a concerted effort of pharmacists to perpetuate the ideals for which Procter stood.

Finally, I may say that this is the first attempt made in America to so honor a member of the pharmaceutical fraternity, and the co-operation of all is desirable that the undertaking may prove not only a success, but in order that pharmacists may show to the world that there are those among them worthy of the highest esteem, and that they themselves duly appreciate and honor the leaders in their ranks.

THE "HOME SANATORIUM" TREATMENT OF CONSUMPTION.[1]

By Joseph H. Pratt, A.M., M.D.,
Physician to Out-Patients, Massachusetts General Hospital,
Assistant in the Theory and Practice of Physic, Harvard University.

Some one has said "there are two kinds of consumption—that of the rich and that of the poor. The former is sometimes cured, the latter never." This still indicates the feeling of most physicians. The attempt to cure tuberculosis in the homes of the poor has seemed well nigh hopeless. Here and there, however, solitary workers like Dr. Flick, of Philadelphia, have obtained admirable results even in the slums of a great city.

As Dr. Osler said in his lecture before the Phipps Institute, "The problem of tuberculosis is in its most important aspect a home

[1] Read before the Johns Hopkins Hospital Medical Society, January 23, 1906, and abstracted from *Johns Hopkins Hospital Bulletin*, xvii, No. 182, p. 140.

problem. The vast majority of all tuberculous patients must be treated in their homes."[1]

The success of the sanatorium and climatic treatment of consumption is universally recognized. Yet the essential feature of the sanatorium treatment is careful regulation of the details of the daily life, and the essential feature of the climatic treatment is life in the open air.

In warm climates and in cold, at low altitudes and at high, consumption has been successfully treated wherever the out-of-door life has been adopted, and the modern method of treatment followed.

Since 1891 Dr. Bowditch has been demonstrating at the Sharon Sanatorium that consumption can be successfully treated in this supposedly unfavorable climate.

Dr. Millet, of East Bridgewater, was the first to advocate out-of-door sleeping in a harsh climate. In January, 1900, he published an important paper which bore the significant title, "The Night-Air of New England in the Treatment of Consumption."[2] It would be well if the truths contained in Dr. Millet's paper could be impressed upon every physician called upon to treat this disease.

Last winter I became acquainted with the methods used by Dr. C. L. Minor, of Asheville, N. C., in carrying out the hygienic-dietetic treatment among private patients outside of a sanatorium. The regulation of the daily life, the discipline enforced, and the results obtained by Dr. Minor compare favorably with those of the best sanatoria.

I became convinced that it was possible to carry out the same system in the homes of the poor even in a crowded city. For the opportunity to submit my plan to a practical test I am indebted to the Rev. Elwood Worcester, and to Emmanuel Church for financial support.

The reason that the results of home and dispensary treatment

---

[1] Few if any States have greater facilities for sanatorium treatment than Massachusetts. It has been estimated that there are at the present time no less than 14,000 consumptives within its borders. For these 375 beds are available. In other words, about 3 per cent. can be treated in the State sanatorium. As consumption is a disease of the poor, it is evident that most of the cases comprising the remaining 97 per cent. must be treated in their homes, if they are to be treated at all.

[2] *Maryland Medical Journal*, January, 1900.

have been on the whole unsatisfactory is due to the lack of the careful supervision, and the lack of the strict discipline maintained in sanatoria. The tuberculosis dispensaries have been a potent factor in preventing the spread of the disease, and in educating the patients and the general public. But, I believe, relatively few cases treated by dispensary methods have been cured. This has certainly been the experience of my colleagues and myself in the out-patient department of the Massachusetts General Hospital, where the dispensary methods with the aid of the District Nursing Association have been employed for several years. The difference between our method and that of the tuberculosis dispensary is essentially this: that the tuberculosis dispensary gives a relatively small amount of care to a large number of patients, while we give a large amount of care to a small number of patients.

Our organization is known as the Emmanuel Church Tuberculosis Class. We sometimes speak of it as a "home sanatorium," and it bears much the same relation to a sanatorium that a correspondence course does to a college course. Every detail of the daily life is supervised and strict discipline maintained. A nurse is employed who devotes her time to visiting the members of the class. I prefer the term "friendly visitor" to nurse, because it describes more exactly the nature of her duties. She should be the family's wise counsellor, kindly and tactful, yet a good disciplinarian.

The class should number but a few members; I think the maximum limit should be twenty-five.

It should never be forgotten that it is the individual, not the disease, that needs treatment. We have been fortunate in having a small class, and so we have come to know our patients not simply as "this case of fibroid phthisis," and "that of pyopneumothorax," but as "Elmer" and "Patrick."

The class was organized the first of July, 1905. Most of the applicants for membership were referred to us by the Out-patient Department of the Massachusetts General Hospital.

The rule was established that no one would be accepted until the clinical diagnosis was confirmed either by finding the tubercle bacilli or by a positive tuberculin test. There has been, however, no difficulty in demonstrating tubercle bacilli in the sputum of all our patients on admission to the class.

Our aid has been refused to none. Those who were too ill for

home treatment have been visited by our nurse until admission could be secured to some hospital or until transferred to the District Nursing Association. We have placed consumptives in the Carney Hospital, the House of the Good Samaritan, and the Free Hospital for Consumptives.

Admission to the class has not been limited to favorable cases. In fact, only two of our patients were in the incipient stage of the disease.

All of our patients have been poor. None could afford even the $4.00 per week charged at the State Sanatorium. Not all the members are intelligent. Several are unusually stupid. In the family of Zelek P., a Russian Jew, no one can write English, and his wife cannot speak English.

Before admission to the class is granted the applicant must promise to give up all work, to live the out-of-door life, and to obey all the rules of the class. The truth of Brehmer's motto that "The most profitable work for a sick man is to get well," is impressed upon the patient. After the decision to join the class has been made a clinical history is taken and a complete physical examination made and entered on the clinical records. Once a month the lungs and sputum are re-examined. The patients are visited by the nurse as soon as they enter the class. Often before the decision has been made the nurse is sent to discuss the question with the invalid and his family, and to determine whether it will be possible to carry out the open-air treatment in their home. If there be no roof, balcony, piazza, or yard available for the rest treatment in the open air, the family must move to a tenement that will enable the tuberculous invalid to spend the entire day and night out-of-doors. Our friendly visitors have spent much time in seeking satisfactory tenements for the members. At the first visit the nurse examines the house and locality, obtains the social history of the case, ascertains the exact financial condition, and gives what instruction may be necessary to prevent the spread of the disease. The first visit usually requires two hours or more. A detailed report of this is at once given to the physician in charge. Subsequent visits by the nurse are made as required. Usually the patient is visited daily or at short intervals, until the details of the treatment are understood and followed. It has been found that repeated visits are often neces-

sary before some of the simplest rules are fixed in the minds of the invalid and his friends.

On January 5, 1906, the class numbered fifteen members, and all but one were sleeping out-of-doors. The single exception is a patient who would have done so had his landlord not prevented him from putting up a tent on the roof. At present he sleeps with his head out of the window of his bed-room. One of our class sleeps on a balcony, the others in tents placed either on the roof or on the ground near the house. The tents have generally been loaned —as few of the members could afford to buy them. An ordinary 7 feet by 7 feet wall tent with a fly has been found satisfactory. This costs only $7.25. Except the time taken for meals, bath and exercise, the entire day is spent in the recumbent or semi-recumbent posture. A comfortable reclining chair is furnished each patient.

The prescribed diet consists chiefly of milk, bread, fruit, butter, and oil. Most of our patients drink two to three quarts of milk a day. In a few instances unsalted butter has been furnished free. Cotton-seed oil has been found to be a satisfactory and inexpensive substitute for olive oil.

For the first few weeks no exercise is allowed, and later only when the temperature is normal the entire day. Then the exact amount of exercise is prescribed. The patient begins by walking five minutes in the morning and five in the afternoon. It is required that a watch be carried and the exact duration of the walk noted in his record book. After exercising, the temperature is taken and recorded. If rise of temperature occurs or if the patient becomes tired the amount of exercise is diminished. If the patient continues to improve, the exercise is gradually increased. Some of our patients now walk several hours daily. During the summer and fall our fever-free patients enjoyed the privileges of the Parker Hill Day Sanatorium.

An important aid in maintaining our strict hygienic regimen is furnished by the individual record book. The form of record adopted is that devised by Dr. Minor, of Asheville. Every detail of the day is recorded : The food eaten, including the total amount of milk and oil taken; the number of hours out-of-doors. The temperature and pulse-rate are entered and the quantity and character of the expectoration. The patients now keep out-of-door life

charts. This keeping of records serves to impress upon the members the importance of attention to detail in the treatment. It helps them to persevere in their monotonous life. We have found that it does not depress their spirits or cause introspection. It serves rather to keep up their courage. Most of the class take great pride in their records. Of course if a patient were doing badly, and losing weight rapidly, the individual record would be omitted.

A weekly meeting of the class has been held on Friday afternoons, formerly in my consulting room, now at the Massachusetts General Hospital. The record books are then inspected, and the patient's weight, temperature, pulse, and vital capacity are taken.

Expenses.—Emmanuel Church has paid for a special nurse, furnished tents, reclining chairs, and all other necessary supplies. To a few of the members a small amount of money has been loaned, and aid has been offered when it was necessary for a family to move to another tenement. A nominal fee of $2.00 a month is required from each patient. In some instances this has been remitted. The total expenses for the first six months ending January, 1906, were $513.00.

Miss Isabel Strong, acting as friendly visitor, gave her entire time to the work without pay during July and August. Dr. J. B. Hawes has assisted me in the medical work since the organization of the class. Recently Dr. C. S. Millet and Dr. N. K. Wood have associated themselves with us, and Dr. C. L. Tobey has taken charge of the laryngological work.

Old tuberculin has been used in a number of cases with apparent benefit. Pharmacotherapy has not been employed except for special conditions, such as constipation or diarrhœa. A few patients have been given creosote. Hydrotherapy has been found of value in every case. *Teilwaschungen*, full baths, chest compresses were the procedures selected.

Results.—Of the nine patients who have been members of the class for three months or more all show a gain in weight and all but two improvement in their general condition. One patient's weight has increased 40¼ pounds. In five of the nine cases the disease has been arrested. The term "arrested" is used in the sense in which it is employed by the Committee on Nomenclature of the National Association for Study and Prevention of Tuberculosis in their proposed classification.

WEIGHT-TABLE OF ALL WHO HAVE BEEN MEMBERS OF THE CLASS FOR THREE MONTHS OR MORE.

Name.	Date of Admission.	Weight.	Last Examination.	Weight.	Gain.	No. of Weeks.
1. Minnie E.	July 3	102¾	Jan. 12	114¼	11½	27
2. Elmer C.	July 12	106	Jan. 5	130½	24½	25
3. Zelek P.	July 12	131½	Jan. 12	171	39½	26
4. John H.	July 18	131	Jan. 12	153¼	22¼	25
5. Samuel T.	July 27	142	Jan. 5	165¼	23¼	24
6. Maria F.	July 29	117	Jan. 12	138½	21½	25
7. Samuel H.	Aug. 7	125½	Jan. 12	132½	7	22
8. William F.	Sept. 2	145	Jan. 12	166¼	21¼	19
9. Patrick C.	Sept. 15	120⅛	Jan. 12	124	3⅞	17

Average gain, 19.4 pounds.

PROGRESS IN PHARMACY.

A QUARTERLY REVIEW OF SOME OF THE MORE IMPORTANT ADVANCES IN PHARMACY AND MATERIA MEDICA.

BY M. I. WILBERT,
Apothecary at the German Hospital, Philadelphia.

The Fifty-ninth Congress of the United States has, so far, enacted several measures that bid fair to have far-reaching influences on the future development of the drug and apothecary business, and will no doubt tend to hasten the advent of better conditions in the practice of pharmacy.

By far the most interesting, if not the most vitally important, step that has as yet been made in the progress of pharmacy along professional lines, is embodied in the act that is now popularly referred to as "The Pure Food Law."

Pharmacists, as well as all friends of true pharmacy, are to be congratulated on the success that has attended the efforts that have been made at various times to hedge in, or to at least partially control, the fraudulent and even criminal practices that are so widely followed in connection with the manufacture and sale of what purport to be medicinal preparations. Pharmacists better than any other class realize the far-reaching possibilities, and pharmacists also know, and to some extent appreciate, the ease with which all kinds and classes of people have been deceived and defrauded in connection with so-called proprietary or patent medicines. While it is

true that from an economic point of view the drug sections of the pure food law are of comparatively minor importance it is also true that if properly enforced these sections will tend to prevent the unnecessary expenditure of millions of dollars, and, what is of even greater importance, will also tend to prevent the doing of untold injury by nostrums, both directly by producing untoward and unexpected physiologic effects, and indirectly, by failing to produce the effects claimed by the manufacturer or his agents. If the several sections relating to drugs and medicines are, as they should be, the forerunners of additional anti-narcotic legislation on the parts of the several State legislatures, they will contribute very materially to eliminate entirely many of the more objectionable preparations that are now sold as medicine.

Much of the ultimate success of pure drug, anti-nostrum and anti-narcotic legislation will necessarily depend on the support that is given to the enforcement of these laws by members of the several branches of the drug trade; and the ultimate results on pharmacy itself will necessarily be a reflection of the attitude taken by pharmacists in connection therewith.

It will be quite safe to assert, however, that quite apart from any action or lack of action that may be taken by the several branches of the drug trade, in connection with nostrums and narcotics, the physicians of the country, and even the people themselves, have been aroused by the, at times perhaps overdrawn, articles that have been published in lay journals, and will certainly demand legislation that will effectually control the misleading, not to say criminal, exploitation of dangerous or fraudulent nostrums. The pharmacist should and does know of the direct as well as of the indirect harm that has been done by the use of secret remedies, and it is gratifying indeed to note that the more representative members of the pharmaceutical profession, even in this country, have consistently been in favor of the particular kind of legislation involved in the recently enacted pure food bill. In support of this statement it will be but necessary to refer to the repeatedly expressed views of such prominent American pharmacists as the late Charles Rice, Prof. A. B. Prescott, John M. Maisch or Fred. Hoffman, and it may be interesting to add that the need for legislation along these very lines was discussed in the meetings of the American Pharmaceutical Association more than half a century ago and that an outline of a law

regulating the manufacture and sale of nostrums was reported to that association by Dr. Charles Rice, Prof. A. B. Prescott and Dr. Fred. Hoffman, some twenty-five years ago, at the meeting of the American Pharmaceutical Association in Pittsburg.

The National Pure Food Bill, as it was finally adopted in both houses of Congress, on recommendation of the joint Conference Committee, is entitled: "An Act preventing the manufacture, sale or transportation of adulterated or misbranded or poisonous or deleterious foods, drugs, medicines and liquors, and for regulating traffic therein and for other purposes."

The law itself is prefaced by the statement that: "Any person who shall violate any of the provisions of this law shall be guilty of a misdemeanor and for each offense shall, upon conviction thereof, be fined not to exceed $500 or shall be sentenced to one year's imprisonment, or both such fine and imprisonment, in the discretion of the court, and for each subsequent offense and conviction thereof shall be fined not less than $1,000 or sentenced to one year's imprisonment, or both such fine and imprisonment, in the discretion of the court."

The law as enacted is applicable only to such articles or preparations as may occur in interstate commerce and is not applicable to preparations or products that have a purely local origin and sale. The carrying out of the provisions of the act has been entrusted to the Secretary of the Treasury, the Secretary of Agriculture and the Secretary of Commerce and Labor, and the examinations of specimens of foods and drugs are to be under the direction of the Bureau of Chemistry of the Department of Agriculture.

The term "drug," according to the provisions of this act, "Shall include all medicines and preparations recognized in the United States Pharmacopœia or National Formulary for internal or external use, and any substance or mixture of substances intended to be used for the cure, mitigation, or prevention of disease of either man or other animals."

Drugs shall be deemed adulterated:

"First. If when a drug is sold under or by a name recognized in the United States Pharmacopœia or National Formulary, it differs from the standard of strength, quality, or purity as determined by the test laid down in the United States Pharmacopœia or National Formulary official at the time of investigation: Provided, That no

drug defined in the United States Pharmacopœia or National Formulary shall be deemed to be adulterated under this provision if the standard of strength, quality or purity be plainly stated upon the bottle, box, or other container thereof, although the standard may differ from that determined by the test laid down in the United States Pharmacopœia or National Formulary.

"Second. If its standard or purity fall below the professed standard or quality under which it is sold."

An article, in case of drugs, shall also be deemed to be misbranded:

"First. If it be an imitation of or offered for sale under the distinctive name of another article.

"Second. If it be labelled or branded so as to deceive or mislead the purchaser, or purport to be a foreign product when not so, or if the contents of the package as originally put up shall have been removed in whole or in part and other contents shall have been placed in such package, or if it fail to bear a statement on the label of the quantity or proportion of any alcohol, morphin, opium cocain, heroin, alpha or beta eucain, chloroform, cannabis indica, chloral hydrate, or acetanilid or any derivative or preparation of any such substances contained therein."

This latter provision is the one that met with strenuous opposition from the members and friends of the Proprietary Association of America. While the provision undoubtedly will, at first, entail a considerable amount of expense on the part of manufacturers of proprietary preparations, it is but a stepping-stone to the full and complete information that must eventually be and very properly should be required in connection with preparations of this kind. Full and complete publicity in connection with proprietary preparations would tend to eliminate all that are of a fraudulent or of a dangerous character, while it would, at the same time, be of tremendous advantage to the manufacturer who really has an original or a meritorious article for which he is desirous to secure a market.

The retail dealer, in drugs as well as foodstuffs, is exempt from prosecution under the provisions of this act "when he can establish a guaranty signed by the wholesaler, jobber, manufacturer or other party residing in the United States, from whom he purchases such articles, to the effect that the same is not adulterated or misbranded within the meaning of this act." Such a guaranty to afford protec-

tion must contain the name or names of the party making the sale and such party or parties shall in turn be held responsible. This provision would appear to be ample to protect the retail dealer who confines his business transactions to responsible parties, who, in turn, are willing and able to guarantee the purity and character of their wares.

The law itself is to become effective on and after January 1, 1907, and retail pharmacists can do much toward popularizing the provisions relating to drugs and medicines by themselves insisting that the several provisions of the act be complied with by manufacturers and dealers.

Denatured Alcohol.—The law providing for the use of tax-free alcohol in the arts and manufactures is another measure that has been enacted by the present Congress that bids fair to be of great economic importance to the community at large, and incidentally also to pharmacists. While tax-free alcohol will not be available for use in pharmaceutical products the use of denatured ethyl or grain alcohol, as a solvent in the mechanic arts, bids fair to replace the use of wood alcohol, and probably other solvents. The law will also tend to stimulate research and experiment with the use as also the economic production of alcohol and will eventually lead to more liberal provisions being made for the use of pure ethyl alcohol in the manufacture of chemicals and pharmaceutical galenicals.

Alcohol Lamps.—In connection with the prospective use of tax-free alcohol it may be interesting to refer to a paper read by Messrs. R. Duchemin and H. Carrol at the International Congress of Applied Chemistry. The authors reported a series of observations on the causes of chemical action on the metal parts of lamps and heating apparatus. They found that the quantity of acid in ethyl alcohol is sufficient to account for the way spirit attacks metals. The acidity resulting from burning methyl alcohol is slightly less than that of ethyl alcohol. Acetone causes comparatively little acidity. They also found that the temperature and the quantity of air consumed influence the proportion of acid yielded by the alcohol.

The corrosive influence of burning alcohol on metals is, however, but one of a number of problems that will present themselves with the more extended use of alcohol in the arts.

The International Congress of Applied Chemistry, which met in the city of Rome, Italy, on April 25, 1906, was well attended, and by

far the greater number of the eleven sections into which the Congress was divided had papers of unusual interest presented to them.

Section VIII, devoted to Hygiene, Medical and Pharmaceutical Chemistry, was unfortunately one of the less important ones. Even in this section, however, pharmacists, particularly German pharmacists, were well represented and took an active part in the proceedings.

Among the papers that are of interest to pharmacists we may mention "The Quantitative Estimation of Fatty Acids," by Dr. Braun; "Testing Commercial Carbonic Acid Gas," by W. Lohman; "The Use of Ferments in Analytical Work," by Professor Bourquelot; and "The Influence of Halogen Salts on the Fluorescence of Quinine," by M. Deniges.

The concluding general session of the Congress adopted at least one resolution that is deserving of careful consideration on the part of American pharmacists. In this resolution the International Congress for Applied Chemistry expresses the wish that in countries where the more detailed instruction in the chemistry of food products has not been otherwise provided for it be taken up and elaborated in connection with pharmaceutical instruction; the members of the Congress believing that the demands that are now being made on pharmacists by the ever-increasing advances in hygiene and therapeutics would serve to particularly fit members of the pharmaceutical profession to take up the study and investigation of food products.

The Perkin Jubilee.—The semi-centennial of the introduction of coal-tar colors, which has but recently been celebrated in England, is of interest to pharmacists in that the discovery of "mauve," the first of these dyes, by William Henry Perkin, grew out of his experiments to produce quinine artificially. Out of the subsequently very rapid development of the coal-tar color industry there grew, some twenty-five years later, the present-day gigantic business of coal-tar remedies, which, while they may prove to be an unmixed blessing to therapeutists, have certainly not had an altogether creditable effect on the evolution of pharmacy in America.

The British Pharmaceutical Conference.—The forty-third annual meeting of the British Pharmaceutical Conference was held in Birmingham during the week following July 23d. This city has the distinction of being the first meeting place to entertain the Confer-

ence for the third time, and the meeting itself is reported to have been an eminently successful one.

The proceedings were inaugurated on the evening of Monday, July 23d, by a reception, in the City Municipal Buildings, where the visiting members were received by the Lord Mayor and Lady Mayoress of Birmingham assisted by members of the City Council.

The scientific business of the Conference was formally opened on Tuesday morning by the usual addresses of welcome, which in turn were followed by the annual address of the President, Mr. W. A. H. Naylor. This address was largely devoted to a review of some of the problems connected with common or well-known drugs that require further elucidation and study. The review includes such well-known and widely used drugs as aloes, balsam of tolu, cantharides, gelsemium, ginger, guaiac resin, hops, male fern, myrrh, senega and veratrin, and is certainly deserving of the attention of all who are in any way interested in research work. The communications read before the Conference, while not epoch-making, included many that were of more than usual interest, and all of the papers contained material that will be found to be of practical value to the pharmacist.

Messrs. Farr and Wright discussed the "Nitric Acid Process for the Determination of Strychnine," as adopted in the U.S.P., and also made some further communication on their work in connection with "Standardized Powdered Extract of Nux Vomica."

Mr. H. G. Smith read a paper on "Some Recent Chemical Discoveries in the Eucalyptus," in which he calls attention to the numerous definite constituents that are obtainable from the several species of Eucalyptus.

The Activity of Pepsin after brief contact with certain inorganic compounds. The author of this paper, Mr. J. F. Tocher, concludes that solutions of alkaline carbonates and hydrates destroy the activity of, and should not be prescribed with, pepsin; bismuth carbonate precipitates pepsin from aqueous solutions; morphine retards the action of pepsin.

Strophanthus and Strophanthin.—Under this title E. W. Mann records some interesting experiments in estimating the amount as well as the nature of the active principle of strophanthus. He concludes that in view of the very marked difference in the activity of the glucoside, obtained from the several varieties of strophanthus,

standardization is only of real value when the botanical source of the seeds is fully known.

Flora of the Lickey Hills.—This paper, by Mr. John Humphreys, includes an interesting account of the geological features as well as the flora of the Lickey Hills and represents a contribution on the local flora that has come to be an annual feature of the B.P.C. This, it may be added, is a feature that might well be introduced into our own annual meeting of the American Pharmaceutical Association.

Another feature that appears to be well worth imitating is to be found in the very full and complete abstracts of the papers that are published in all of the British pharmaceutical journals within a day or two after the close of the Conference meetings.

Mr. Thomas Tyrer was elected to preside over the Conference at its next meeting, and Manchester was unanimously selected as being the most desirable place of meeting.

The National Formulary.—The third edition, second decennial revision, of this well-known and now legally recognized formulary, has just been issued, and the first edition of 5,000 copies is said to have been sold before publication. The recognition that has been accorded the National Formulary in the recently enacted "Pure Food Law" gives to this book an entirely new aspect and will make its possession practically compulsory, not alone to wholesale dealers and manufacturers but also to the retail pharmacist. Fortunately the price at which the volume is being sold, $1.00, cannot be said to be exorbitant, and there is really no excuse on the part of the pharmacist why the Formulary should not be consulted at first hand.

The book itself, while it contains many excellent formulas that are practically above reproach, will undoubtedly meet with considerable, just as well as unjust, criticisms, all of which will tend to make future revisions of the book even more desirable and more perfect.

Probably the most striking of the new features of the book is to be found in the duplicate weights and measures. This inclusion of both the metric and apothecaries weights and measures detracts considerably from the appearance and the true usefulness of the book in that it is distracting; the formulas themselves losing much of the simple form and concise character that served to dignify and to enhance the working value of earlier editions of the Formulary.

New Belgian Pharmacopœia.—The recently issued third edition of the Belgian Pharmacopœia is the latest addition to the newly revised national pharmacopœias.

As might have been expected from the interest that was taken by the Belgian Government in the proceedings of the Conference for the Unification of the Formulæ of Potent Medicaments, the protocol adopted by that Conference has been closely adhered to in the descriptions and formulas contained in this pharmacopœia.

While the Belgian Pharmacopœia cannot be said to embody any distinctively radical innovations it does contain a number of features that might profitably be included in our own U.S.P.

As in some of the other recently issued foreign pharmacopœias directions for sterilizing medicinal preparations, as well as the apparatus with which they are to come in contact, are given at some length.

Wherever practicable, essential oils are represented by their principal constituents free from terpenes.

Physiological sodium chloride solution is directed to be made by dissolving 0·8 per cent. of sodium chloride in distilled water, and sterilizing the resulting solution.

A list of the drugs and preparations which must be kept in every pharmacy is appended, also a list of the reagents and the necessary apparatus for carrying out the prescribed chemical tests.

Austrian Pharmacopœia.—At the urgent request of the Austrian pharmacists the Government has deferred the date on which the recently published pharmacopœia is to become official, until January 1, 1907. This has been done to allow pharmacists the necessary time to become acquainted with the many changes that have been introduced and to prepare their medicaments accordingly.

Belgian Pharmacists Decorated.—Belgium is one of the comparatively few countries where the educational qualifications that are exacted of pharmaceutical students are exceptionally high, the degree of Doctor of Science being required before a student can register as a pharmaceutical student in one of the three universities that give pharmaceutical instruction. That the ultimate results are appreciated is evidenced by the fact that the Belgian Government has recently paid a high compliment to the practitioners of pharmacy in that country by decorating no less than eleven Belgian pharmacists with crosses as Chevaliers of the Order of Leopold.

The recent number of the *Journal de Pharmacie d'Anvers* contains an interesting account of the banquet which took place on June 10th, and also contains biographical sketches and portraits of the decorated pharmacists.

Abbreviations for Metric Units.—The French Minister of Public Instruction, M. Briand, has by a recent decision arranged that all professors and teachers throughout France are in future to employ distinctive abbreviations for the various weights and measures. These abbreviations are particularly interesting in that, with the single exception of the three higher designations of the measure of length, myriamétre, Mm.; kilométre, Km.; and hectométre, Hm., all of the abbreviations are lower-case letters.

Thus we have g. for gramme in place of the Gm. of the U.S.P., and kl., l., and mil., for kilolitre, litre, and millilitre. The latter abbreviation corresponds to what is ambiguously abbreviated Cc. in the U.S.P., and has the added advantage that it allows of further subdivision of the millilitre, or, as we choose to call it, the cubic centimeter, for which the abbreviations, d. or dmil. and c. or cmil., for decimil and centimil respectively, have been proposed. (*Phar. Jour.*, July 28, 1906, page 65.)

The British Medical Association and Secret Remedies.—Even the proverbially slow-going English people are beginning to awaken to a realization of the frauds that have been and are now being perpetrated under the guise of proprietary medicine. The medico-political committee of the British Medical Association, at the recent annual representative meeting, presented a series of recommendations with regard to the sale of proprietary remedies that, if they could be enacted into a law, would go far toward reducing the sale of these preparations in England.

It was proposed:

(*a*) That medicines which are supplied otherwise than upon medical, dental or veterinarian prescriptions no condition of sale short of the publicity on each packet of medicine of the name and the quantity of each of its constituents be permitted.

(*b*) That the label should be made a warranty, and that false descriptions, whether on the label or in advertisement, should be made an offense.

(*c*) That the provisions of the foods and drugs acts should be applied to proprietary medicines. (*Phar. Jour.*, 1906, page 46.)

The Plague of Fancy Names.—Gnomon (*Phar. Jour.*, May 12, 1906, page 550), in commenting on the renaming of well-known and even widely used substances, calls attention to the overwhelming flood of fancy names with which medicine and pharmacy are being threatened at the present time.

The abuse growing out of the multiplicity of trade-mark names for the same article are even now burdensome and annoying and would certainly appear to be deserving of the thought and the attention of pharmaceutical associations, with a view of offering some relief or of making at least some effort to induce manufacturers to discontinue the practice.

Exclusion of Secret Remedies from North Dakota.—The officials of North Dakota appear to be willing to enforce the recently enacted legislation to control the sale of secret remedies in that State.

Bulletin 69 of the North Dakota Agricultural Experiment Station, issue of June, 1906, calls attention to a number of articles that have so far been examined by the officials. The further sale of these preparations will not be permitted in the State until all of the several requirements of the law have been fully complied with. (*Jour. Am. Med. Assoc.*, July 28, 1906.)

New Elements.—Sir William Crookes, in a note published in the *Chemical News*, describes spectroscopic observations of the phosphorescent glow emitted by some of the rare earths, exposed to cathode rays in vacuo, which indicate the existence of two new elements. These he has provisionally named ionium and incognitum.

Oxidation Compounds of Strychnine.—Mattison has produced a series of oxidation compounds of strychnine by means of hydrogen dioxide. Some of these compounds he found to be acid and some basic in their nature. One of the more interesting which he designates as strychnine oxide, occurs as large colorless prisms having the formula $C_{21}H_{22}N_2O_3 + {}_3H_2O$. It is found to have practically as poisonous properties as strychnine. (*Chem. and Drug.*, 1906, page 810.)

Corosuccin.—This is said to be an antiseptic and is composed of a concentrated solution of succinic acid with traces of mercuric chloride. It is asserted that succinic acid materially enhances the antiseptic action of mercuric chloride; so much so that a 1–20,000 solution of mercuric chloride containing 2.5 per cent. of succinic acid is said to have an antiseptic value corresponding to that of a 2 per cent. solution of mercuric chloride. (*Apothek. Zeit.*, 1906, page 479.)

Estoral.—This is described as the boric ether of menthol and occurs in the form of a white crystalline powder having a faint odor of menthol. Estoral when brought in contact with mucous membranes is rapidly decomposed into its constituents. It has been used, with reported good results, in cases of chronic nasal catarrh. (*Jour. d. Phar. et d. Chem.*, July, 1906, page 25.)

New Sidonal.—According to the researches of F. Zernik (*Apothek. Zeit'g*, 1906, page 463) this is not a readily defined chemical compound, but a mixture of approximately 75 parts of quinic anhydride and 25 parts of quinic acid.

Omoral.—This is said to be a compound of silver and albumin, containing 10 per cent. of silver. It occurs as a fine yellowish powder soluble in physiological salt solution and in alkaline liquids in the proportion of about 3–100. (*Apothek. Zeit.*, 1906, page 491.)

Ovogal.—This is said to be a combination of ovalbumin with glycocholic and taurocholic acids. It is being exploited as a cholagogue and occurs as a greenish yellow powder which is insoluble in most solvents, but dissolves, with decomposition, in alkaline solutions. Ovogal is directed to be given in doses of one teaspoonful suspended in a suitable vehicle, or given in cachets or capsules. (*Phar. Zeit.*, 1906, page 460.)

Propylbarbituric acid is being sold in Germany as a substitute for proponal, di-propyl barbituric acid, a recently introduced hypnotic.

According to Dr. F. Zernik, who has recently reviewed the literature relating to proponal and veronal, the latter is to be considered the more active in smaller doses (below 0.3 gm.), while proponal undoubtedly possesses the advantage of being more active, but the disadvantage of being less safe, in doses of 0·4 or 0·5 grammes (*Apothek. Zeit.*, 1906, page 524).

Salicin versus Salicylates.—An abstract in the *Pharmaceutical Journal* (May 12, 1906, page 548) calls renewed attention to the repeatedly made claims that salicin is preferable to the salicylates for the treatment of acute rheumatism. Salicin acts as a tonic, whereas the salicylates are powerful depressants. Cases treated with salicylates are very apt to drift into endocarditis, with permanent valvular lesions.

Sambunigrin.—Bourquelot and Danjou have isolated a glucoside from the leaves of Sambucus nigra which, when decomposed with emulsin, yielded hydrocyanic acid, benzoic aldehyde and glucose.

The new glucoside is slightly bitter and crystallizes in long, white, needle-shaped crystals. It is readily soluble in water, alcohol and in ether. (*Phar. Post.*, 1906, page 351, from *Compt. Rend.*)

Sulphopyrine.—This is the name applied to antipyrine-para amido benzol sulphonate, which is now being introduced as a remedy for migraine and similar affections. It occurs as a white, non-hygroscopic powder which is very soluble in water. The dose is 1 gramme in half a glassful of water, and may be repeated several times a day. (*Phar. Jour.*, May 26, 1906, page 645.)

In a recent communication from the Pharmaceutical Institute of the University of Berlin, Dr. F. Zernik asserts that sulphopyrine is not the true antipyrine salt of para amido benzol sulphonic acid, but is a mixture composed approximately of 86·5 parts of antipyrine and 13·5 parts of sulphonic acid. (*Apothek. Zeit.*, 1906, page 549.)

Styracol.—This is said to be a combination of cinnamic acid and guaiacol which when brought in contact with alkaline solutions decomposes into its constituents.

Styracol is insoluble in water or in diluted acids and is devoid of odor or taste. It may be given in doses of 0·50 to 1·00 gm. three or four times a day and has been recommended as being an efficient intestinal antiseptic. (*Jour. d. Phar. et d. Chem.*, July, 1906, page 25.)

Theophorin.—This is described as being a double salt of theobromin sodium and sodium formate. It occurs as a fine white powder that is readily soluble in water and is said to be an efficient diuretic. It may be given in doses of 0·5 to 1·0 gramme three times a day, preferably in the form of powder, as the solutions are readily decomposed by acids, even carbonic acid causing a turbidity and gradual decomposition. (*Phar. Post.*, 1906, page 298.)

PURE FOOD BILL.

An Act for preventing the manufacture, sale, or transportation of adulterated or misbranded or poisonous foods, drugs, medicines, and liquors, and for regulating traffic therein, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be unlawful for any person to manufacture within any Territory or the District of Columbia any article of food or drug which is adulterated or misbranded, within the meaning of this Act; and any person

who shall violate any of the provisions of this section shall be guilty of a misdemeanor, and for each offense shall, upon conviction thereof, be fined not to exceed five hundred dollars or shall be sentenced to one year's imprisonment, or both such fine and imprisonment, in the discretion of the court, and for each subsequent offense and conviction thereof shall be fined not less than one thousand dollars or sentenced to one year's imprisonment, or both such fine and imprisonment, in the discretion of the court.

Sec. 2. That the introduction into any State or Territory or the District of Columbia from any other State or Territory or the District of Columbia, or from any foreign country, or shipment to any foreign country of any article of food or drugs which is adulterated or misbranded, within the meaning of this Act, is hereby prohibited; and any person who shall ship or deliver for shipment from any State or Territory or the District of Columbia to any other State or Territory or the District of Columbia, or to a foreign country, or who shall receive in any State or Territory or the District of Columbia from any other State or Territory or the District of Columbia, or foreign country, and having so received, shall deliver, in original unbroken packages, for pay or otherwise, or offer to deliver to any other person, any such article so adulterated or misbranded within the meaning of this Act, or any person who shall sell or offer for sale in the District of Columbia or the Territories of the United States any such adulterated or misbranded foods or drugs, or export or offer to export the same to any foreign country, shall be guilty of a misdemeanor, and for such offense be fined not exceeding two hundred dollars for the first offense, and upon conviction for each subsequent offense not exceeding three hundred dollars or be imprisoned not exceeding one year, or both, in the discretion of the court: *Provided*, That no article shall be deemed misbranded or adulterated within the provisions of this Act when intended for export to any foreign country and prepared or packed according to the specifications or directions of the foreign purchaser when no substance is used in the preparation or packing thereof in conflict with the laws of the foreign country to which said article is intended to be shipped; but if said article shall be in fact sold or offered for sale for domestic use or consumption, then this proviso shall not exempt said article from the operation of any of the other provisions of this Act.

Sec. 3. That the Secretary of the Treasury, the Secretary of Agriculture, and the Secretary of Commerce and Labor shall make uniform rules and regulations for carrying out the provisions of this Act, including the collection and examination of specimens of foods and drugs manufactured or offered for sale in the District of Columbia, or in any Territory of the United States, or which shall be offered for sale in unbroken packages in any State other than that in which they shall have been respectively manufactured or produced, or which shall be received from any foreign country, or intended for shipment to any foreign country, or which may be submitted for examination by the chief health, food, or drug officer of any State, Territory, or the District of Columbia, or at any domestic or foreign port through which such product is offered for interstate commerce, or for export or import between the United States and any foreign port or country.

Sec. 4. That the examinations of specimens of foods and drugs shall be made in the Bureau of Chemisty of the Department of Agriculture, or under the direction and supervision of such Bureau; for the purpose of determining from such examinations whether such articles are adulterated or misbranded within the meaning of this Act; and if it shall appear from any such examination that any of such specimens is adulterated or misbranded within the meaning of this Act, the Secretary of Agriculture shall cause notice thereof to be given to the party from whom such sample was obtained. Any party so notified shall be given an opportunity to be heard, under such rules and regulations as may be prescribed as aforesaid, and if it appears that any of the provisions of this Act have been violated by such party, then the Secretary of Agriculture shall at once certify the facts to the proper United States district attorney, with a copy of the results of the analysis or the examination of such article duly authenticated by the analyst or officer making such examination, under the oath of such officer. After judgment of the court, notice shall be given by publication in such manner as may be prescribed by the rules and regulations aforesaid.

Sec. 5. That it shall be the duty of each district attorney to whom the Secretary of Agriculture shall report any violation of this Act, or to whom any health or food or drug officer or agent of any State, Territory, or the District of Columbia shall present satisfactory evidence of any such violation, to cause appropriate pro-

ceedings to be commenced and prosecuted in the proper courts of the United States, without delay, for the enforcement of the penalties as in such cases herein provided.

Sec. 6. That the term "drug," as used in this Act, shall include all medicines and preparations recognized in the United States Pharmacopœia or National Formulary for internal or external use, and any substance or mixture of substances intended to be used for the cure, mitigation, or prevention of disease of either man or other animals. The term "food," as used herein, shall include all articles used for food, drink, confectionery, or condiment by man or other animals, whether simple, mixed, or compound.

Sec. 7. That for the purposes of this Act an article shall be deemed to be adulterated:

In case of drugs:

(1) If, when a drug is sold under or by a name recognized in the United States Pharmacopœia or National Formulary, it differs from the standard of strength, quality, or purity, as determind by the test laid down in the United States Pharmacopœia or National Formulary official at the time of investigation: *Provided*, That no drug defined in the United States Pharmacopœia or National Formulary shall be deemed to be adulterated under this provision if the standard of strength, quality, or purity be plainly stated upon the bottle, box, or other container thereof, although the standard may differ from that determined by the test laid down in the United States Pharmacopœia or National Formulary.

(2) If its strength or purity fall below the professed standard or quality under which it is sold.

In the case of confectionery:

If it contain terra alba, barytes, talc, chrome yellow, or other mineral substance or poisonous color or flavor, or other ingredient deleterious or detrimental to health, or any vinous, malt or spirituous liquor or compound or narcotic drug.

In the case of food:

(1) If any substance has been mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength.

(2) If any substance has been substituted wholly or in part for the article.

(3) If any valuable constituent of the article has been wholly or in part abstracted.

(4) If it be mixed, colored, powdered, coated, or stained in a manner whereby damage or inferiority is concealed.

(5) If it contain any added poisonous or other added deleterious ingredient which may render such article injurious to health: *Provided,* That when in the preparation of food products for shipment they are preserved by any external application applied in such manner that the preservative is necessarily removed mechanically, or by maceration in water, or otherwise, and directions for the removal of said preservative shall be printed on the covering or the package, the provisions of this Act shall be construed as applying only when said products are ready for consumption.

(6) If it consists in whole or in part of a filthy, decomposed, or putrid animal or vegetable substance, or any portion of an animal unfit for food, whether manufactured or not, or if it is the product of a diseased animal, or one that has died otherwise than by slaughter.

SEC. 8. That the term "misbranded," as used herein, shall apply to all drugs, or articles of food, or articles which enter into the composition of food, the package or label of which shall bear any statement, design, or device regarding such article, or the ingredients or substances contained therein which shall be false or misleading in any particular, and to any food or drug product which is falsely branded as to the State, Territory, or country in which it is manufactured or produced.

That for the purposes of this Act an article shall also be deemed to be misbranded:

In case of drugs:

(1) If it be an imitation of or offered for sale under the name of another article.

(2) If the contents of the package as originally put up shall have been removed, in whole or in part, and other contents shall have been placed in such package, or if the package fail to bear a statement on the label of the quantity or proportion of any alcohol, morphine, opium, cocaine, heroin, alpha or beta eucaine, chloroform, cannabis indica, chloral hydrate, or acetanilid, or any derivative or preparation of any such substances contained therein.

In the case of food:

(1) If it be an imitation of or offered for sale under the distinctive name of another article.

(2) If it be labeled or branded so as to deceive or mislead the purchaser, or purport to be a foreign product when not so, or if the contents of the package as originally put up shall have been removed in whole or in part and other contents shall have been placed in such package, or if it fail to bear a statement on the label of the quantity or proportion of any morphine, opium, cocaine, heroin, alpha or beta eucaine, chloroform, cannabis indica, chloral hydrate, or acetanilid, or any derivative or preparation of any of such substances contained therein.

(3) If in package form, and the contents are stated in terms of weight or measure, they are not plainly and correctly stated on the outside of the package.

(4) If the package containing it or its label shall bear any statement, design, or device regarding the ingredients or the substances contained therein, which statement, design, or device shall be false or misleading in any particular: *Provided*, That an article of food which does not contain any added poisonous or deleterious ingredients shall not be deemed to be adulterated or misbranded in the following cases:

(1) In the case of mixtures or compounds which may be now or from time to time hereafter known as articles of food, under their own distinctive names, and not an imitation of or offered for sale under the distinctive name of another article, if the name be accompanied on the same label or brand with a statement of the place where said article has been manufactured or produced.

(2) In the case of articles labeled, branded, or tagged so as to plainly indicate that they are compounds, imitations, or blends, and the word "compound," "imitation," or "blend," as the case may be, is plainly stated on the package in which it is offered for sale: *Provided*, That the term blend as used herein shall be construed to mean a mixture of like substances, not excluding harmless coloring or flavoring ingredients used for the purpose of coloring and flavoring only: *And provided further*, That nothing in this Act shall be construed as requiring or compelling proprietors or manufacturers of proprietary foods which contain no unwholesome added ingredient to disclose their trade formulas, except in so far as the provisions of this Act may require to secure freedom from adulteration or misbranding.

SEC. 9. That no dealer shall be prosecuted under the provisions

of this Act when he can establish a guaranty signed by the wholesaler, jobber, manufacturer, or other party residing in the United States, from whom he purchases such articles, to the effect that the same is not adulterated or misbranded within the meaning of this Act, designating it. Said guaranty, to afford protection, shall contain the name and address of the party or parties making the sale of such articles to such dealer, and in such case said party or parties shall be amenable to the prosecutions, fines, and other penalties which would attach, in due course, to the dealer under the provisions of this Act.

SEC. 10. That any article of food, drug, or liquor that is adulterated or misbranded within the meaning of this Act, and is being transported from one State, Territory, District, or insular possession to another for sale, or, having been transported, remains unloaded, unsold, or in original unbroken packages, or if it be sold or offered for sale in the District of Columbia or the Territories, or insular possessions of the United States, or if it be imported from a foreign country for sale, or if it is intended for export to a foreign country, shall be liable to be proceeded against in any district court of the United States within the district where the same is found, and seized for confiscation by a process of libel for condemnation. And if such article is condemned as being adulterated or misbranded, or of a poisonous or deleterious character, within the meaning of this Act, the same shall be disposed of by destruction or sale, as the said court may direct, and the proceeds thereof, if sold, less the legal costs and charges, shall be paid into the Treasury of the United States, but such goods shall not be sold in any jurisdiction contrary to the provisions of this Act or of the laws of that jurisdiction: *Provided, however,* That upon the payment of the costs of such libel proceedings and the execution and delivery of a good and sufficient bond to the effect that such articles shall not be sold or otherwise disposed of contrary to the provisions of this Act, or the laws of any State, Territory, District, or insular possession, the court may by order direct that such articles be delivered to the owner thereof. The proceedings of such libel cases shall conform, as near as may be, to the proceedings in admiralty, except that either party may demand trial by jury of any issue of fact joined in any such case, and all such proceedings shall be at the suit of and in the name of the United States.

SEC. 11. The Secretary of the Treasury shall deliver to the Secretary of Agriculture, upon his request from time to time, samples of foods and drugs which are being imported into the United States or offered for import, giving notice thereof to the owner or consignee, who may appear before the Secretary of Agriculture, and have the right to introduce testimony, and if it appear from the examination of such samples that any article of food or drug offered to be imported into the United States is adulterated or misbranded within the meaning of this Act, or is otherwise dangerous to the people of the United States, or is of a kind forbidden entry into, or forbidden to be sold or restricted in sale in the country in which it is made or from which it is exported, or is otherwise falsely labeled in any respect, the said article shall be refused admission, and the Secretary of the Treasury shall refuse delivery to the consignee and shall cause the destruction of any goods refused delivery which shall not be exported by the consignee within three months from the date of notice of such refusal under such regulations as the Secretary of the Treasury may prescribe: *Provided*, That the Secretary of the Treasury may deliver to the consignee such goods pending examination and decision in the matter on execution of a penal bond for the amount of the full invoice value of such goods, together with the duty thereon, and on refusal to return such goods for any cause to the custody of the Secretary of the Treasury, when demanded, for the purpose of excluding them from the country, or for any other purpose, said consignee shall forfeit the full amount of the bond: *And provided further*, That all charges for storage, cartage, and labor on goods which are refused admission or delivery shall be paid by the owner or consignee, and in default of such payment shall constitute a lien against any future importation made by such owner or consignee.

SEC. 12. That the term "Territory," as used in this Act, shall include the insular possessions of the United States. The word "person," as in this Act, shall be construed to import both the plural and the singular, as the case demands, and shall include corporations, companies, societies and associations. When construing and enforcing the provisions of this Act, the act, omission, or failure of any officer, agent, or other person acting for or employed by any corporation, company, society, or association, within the scope of his employment or office, shall in every case be also deemed to be

the act, omission, or failure of such corporation, company, society, or association as well as as that of the person.

SEC. 13. That this Act shall be in force and effect from and after the first day of January, nineteen hundred and seven.

Approved, June 30, 1906.

CORRESPONDENCE.

Interest in the Procter Monument is becoming quite general, and the desire to perpetuate the ideals and principles for which Professor Procter stood, seems to be gaining a hold in various quarters.

The following letter from Prof. John Attfield, F.R.S., of Watford, England, is of special interest, showing not only Professor Attfield's interest in the movement of American Pharmacists to honor one of their calling but also his high esteem of Professor Procter and his attainments:—

ASHLANDS, WATFORD, HERTS,
13 August, 1906.

DR. HENRY KRAEMER.

My dear Sir:—Infirmities of age will prevent me attending the approaching meeting of the American Pharmaceutical Association, but by letter I can and do beg the William Procter, Jr., Memorial Fund Committee to accept a small contribution from me towards the cost of the bronze monument commemorative of my dear old friend and of his work for scientific, educational and literary pharmacy. I enclose a money order for twenty-five dollars.

Yours faithfully,
JOHN ATTFIELD.

BOOK REVIEWS.

LEHRBUCH DER INTOXIKATIONEN. Von Dr. Rudolf Kobert, Kaiserlich Russischen Staatsraat, ordentlichem Professor und Direktor des Institutes für Pharmakologie und physiologische Chemie der Landesuniversität Rostock. Zweite durchweg neubearbeitete Auflage. Zwei Bände. Mit Abbildungen im Text. Stuttgart: Verlag von Ferdinand Enke. 1902–1904–1906.

This remarkable work of Kobert's on Poisons continues to be one of the great masterpieces in pharmacology and physiological chemistry. It is profusely illustrated, the illustrations being for the most part original and very excellent. It is intended as a hand-

book for students in medicine and physicians, and is published in two volumes. Volume I is devoted to a general consideration of the subject of poisons and the post-mortem recognition of poisons. Volume II is divided practically into three parts: (1) The consideration of those substances which produce decided alterations in the tissues, as acids, halogens, alkalies and alkaline earths, arsenic, antimony, phosphorus, organic substances, animal products, plant products, as alkaloids, ethereal oils, enzymes, etc. (2) Blood poisons, these being divided according as they affect the blood corpuscles or produce various "ämoglobin" compounds. In part 3 those poisons are considered which cause death, but without producing marked alterations in the tissues, and these are taken up as they affect the cerebrospinal system or act upon the heart.

The entire work consists of over 1600 pages with 211 illustrations and is the most important book on the subject of poisons that has been published. It will be found useful to the food analyst, who is theoretically trying to determine the nature of poisons, as well as the therapeutist whose notion as to what constitutes a poison is often vague and inadequate. The physiological chemist and pharmacologist (the latter class of whom there are unfortunately too few representatives in this country) will find this book an epitome of scientific research marked by an erudition which makes it, as has been stated, a masterpiece of its kind.

Annales de L'Institut Colonial de Marseille. Treizième année. 2e Série. 3e volume, 1905.

In this volume of the Annales of the Colonial Institute of Marseilles, which was founded by Professor Edward Heckel and published under his direction, are the following papers:—

(1) Madagascar in 1756. By M. Bernard. With a preface by Professor Gaffarel.

(2) A Chemical Study of the Oil of the Wood of one of the Diptocarpeæ. By M. Et. Lefeuvre.

(3) The Morphology and Anatomy of Hura Crepitans. By M. Gilles.

(4) The External Morphology and Anatomy of *L' Epeura Falcata* Aublet. By Prof. L. Courchet.

(5) *Perriera Madagascariensis* Courchet. A New Poisonous Simarubaceous Plant. By L. Courchet.

(6) The Botany and Chemistry of *Raphia Pedunculata.* By M. M. Decrock et Fr. Schlagdenhauffen.

(7) Morphology and Anatomy of the Larva *Io Irene Boisduval.* By M. L. Bordas, D. Sc.

JUBILEE OF THE COAL TAR INDUSTRY.

The first meeting in connection with the international celebration of the fiftieth anniversary of the discovery of the first aniline color by Sir William Henry Perkin was held at the Royal Institution, London, on July 26. It was a beautiful morning, and the old lecture-theatre was well filled on the ground floor with an audience of men and women.

At a few minutes after eleven Professor Meldola opened the proceedings by offering Sir William Perkin "hearty congratulations on having lived to witness the consummation of his labors," and on having received the honor of knighthood. Next Professor Meldola referred to the appropriateness of the meeting-place, for it was in that building that Michael Faraday first discovered benzene, the starting-point in the manufacture of aniline colors. [The original sample of benzene was on the table, beside it being early samples of mauve dye and fabrics dyed with the first specimen of mauve.] Professor Meldola next welcomed the foreign colleagues, the names being received with a great outburst of applause. The celebration scheme was then outlined as arranged at the Mansion House meeting in February, consisting briefly of (1) portrait of Sir William Perkin painted by Mr. A. S. Cope, A.R.A., to be held by Sir William during his life and afterwards to be offered to the nation; (2) marble bust by Mr. F. W. Pomeroy, A.R.A., for the Chemical Society's library; and (3) endowment of a Perkin research fund, towards which some £2,000 has already been received.

The portrait was then formally presented to Sir William Perkin, the green curtain which covered it being drawn aside, amid tremendous applause. The portrait represents Sir William with a skein of mauve silk in his hand, on the table being flasks and beakers containing dye stuffs. Attention was next called to the bust, which is a plaster replica of the marble bust, Professor Meldola stating that when it is placed in the library of the Chemical Society it will "act

as an encouragement to all the future generations of chemists in this country."

Geheimrath Professor Dr. Emil Fischer, speaking in German, offered the Hofmann medal of the Deutsche Chemische Gesellschaft to Sir William Perkin. Sir William has been an honorary member of the Society for twenty years, and Dr. Fischer, recalling this fact and his early achievements, referred with pleasure to the recent researches in pure chemistry with which Sir William's name is associated. In English, Dr. Fischer, approaching Sir William Perkin, said, "I am proud to bring you from Germany this token of our esteem and admiration, and hope the medal will give you the more pleasure because it bears upon it the features of your old friend and teacher, August Wilhelm von Hofmann."

Sir William Perkin, in the course of his reply, said that the first volume of the German Chemical Society was a small one, but it contained Graebe and Liebermann's important paper on the synthesis of alizarine from anthracene and Baeyer's paper on the reduction of indigo-blue. The first paper has resulted in the superseding of madder by artificial alizarine, and Baeyer's paper may be looked upon as the first step in the successful manufacture of artificial indigo. Sir William next referred to the many kindnesses he had received from German chemists, and thanked all connected with the jubilee celebration for gifts that had been made to him. The portrait he regarded as the crowning gift of all the recognitions he had received.—*Chem. and Drug.*, August 4, 1906.

NOTES AND NEWS.

DR. JOHN M. FRANCIS, chief chemist for Parke, Davis & Co., has written for the *Bulletin of Pharmacy* a detailed commentary on the Eighth Revision of the United States Pharmacopœia. This has been reprinted as a booklet of 112 pages and in its present form will be found extremely useful. A second edition, limited to 3,000, has just been struck off the press. Copies may be had on application to E. G. Swift, publisher of the *Bulletin of Pharmacy*, Detroit, Michigan.

THE MODERN MATERIA MEDICA, published by *The Druggists' Circular*, 100 William Street, New York City, is a booklet of over 300 pages, giving the source, chemical and physical properties, therapeutic action, dosage, antidotes, and incompatibilities of all additions to the newer materia medica. The book will be found useful to the retail pharmacist as well as the wholesaler as it con-

tains much of the information on newer medicaments, which is scattered through the medical journals, but which has not been incorporated in the text-books. The price of the book is $1.50.

THE ANNUAL LABORATORY REPORT of the Smith, Kline & French Company has been recently published. It contains reports of analyses, besides some original papers. Reports of this kind ought to be in the hands of retail pharmacists, as they show the necessity for testing goods purchased.

PROCTER MONUMENT FUND. The following additional subscriptions have been received:—

John Attfield (London)	$25 00
Frank E. Morgan	10 00
F. Gutekunst	5 00
H. E. Peters	5 00
Samuel P. Sadtler	10 00
W. J. Stoner	1 00
Fred. E. Niece	5 00

PROGRESS IN ALKALOIDAL CHEMISTRY, during the year 1904, by Dr. H. M. Gordin, is the title of Monograph No. 10 of the Pharmaceutical Popular Science Series, edited by Dr. Edward Kremers. The articles forming the basis of this monograph have appeared in the *Pharmaceutical Review.* It is fortunate for the student of pharmacy that these articles have been brought together in this form, as the literature is a rather large and wide one, and the abstracts are unusually full and present a great deal of useful information.

DR. HENRY H. RUSBY is the author of a series of well illustrated and interesting articles on the "Wild Foods of the United States," appearing in *Country Life in America.* In the September issue there are a number of other interesting articles on trees, fruits, birds, stock, poultry, etc.

HERMAN T. FRITZSCHE, senior member of the firm of Schimmel & Co., Leipzig, died on July 24th, of appendicitis, at Marienbad, Bohemia, where he had gone on account of ill-health.

LLOYD LIBRARY.—It has just been made public that in the will of the late Surgeon-General James Pattison Walker, of England, a clause gives to the Lloyd Library a fund of $30,000, and, what is far more valuable than the cash bequest, the entire library owned by the distinguished surgeon and student-scientist. Gen. Walker's collection of books and manuscripts is known to scientific men as one of the most valuable private collections.

THE AMERICAN JOURNAL OF PHARMACY

OCTOBER, 1906.

THE ALKALOIDAL ASSAYS OF THE U.S.P. OF 1900.

By H. M. Gordin.

Having been asked by the editor of this Journal to make a review of the methods adopted in the last edition of the U.S.P. for the assay of alkaloidal drugs and their galenical preparations, I hereby offer a few observations which occurred to me during this examination of the pharmacopœial methods.

On examining the assay methods of crude drugs it will be noticed that different methods are used for different drugs without any good reason so far as I can see. While it is true that not every method is suitable for every drug, it would nevertheless seem to be advisable to adhere to one and the same method wherever it gives as good results in one case as in another. Comparing, for example, the methods adopted for the assay of aconite, belladonna and ipecac, it is difficult to see why the simple method adopted for the first of these drugs would not give as good and concordant results with the other two. In the same way, on comparing the assay methods for the fluid extracts of cinchona bark, aconite, belladonna and ipecac roots, it would seem that the simple and exact method adopted for the assay of the fluid extract of belladonna root would also give good and concordant results with the other fluid extracts, particularly if ether or a mixture of ether and chloroform were substituted for chloroform. That the methods which give good results with belladonna root and its fluid extract are equally well applicable to aconite root and its fluid extract, for example, is in accord with my own experience as well as with the statements of A. B. Lyons in his well known Hand-book of Practical Assaying of Drugs and Galenicals, where the author uses the same methods for the assay of both of these drugs and their fluid extracts.

In some assay methods of the U.S.P. care has been taken to avoid the use of aliquot parts of the real liquids, while in others no such care is taken.

In some assays solid substances are dissolved in ether or a mixture of ether and chloroform and the solutions transferred to a separating funnel. Thus in the assay of extract of nux vomica we are told to dissolve the extract in an open beaker by means of a mixture of ether, chloroform and ammonia water, and when the extract is dissolved to transfer the solution to a separating funnel. As the extract goes only very slowly in solution, requiring continuous stirring with a glass rod, and the liquid has a great tendency to "creep" on the outside of the beaker when poured into the separating funnel, it is easy to see that much greater accuracy would be obtained by weighing the extract directly into the separating funnel, adding the solvent mixture to the powder and shaking the stoppered funnel till the extract is dissolved.

Some of the assay methods of the pharmacopœia are completely unworkable. Such, for example, are the assays of aconite root, its fluid extract and fluid extract of ipecac root, in all of which we are directed to filter the first acid liquids obtained in these assays, but as these liquids are very thick and contain sticky resinous substances, the filters are very soon completely clogged and the assays cannot be finished. This is in accord with my own experience and the experience of several teachers and students in our school.

As hydrastis and its galenical preparations are standardized in the new pharmacopœia an assay method ought also to be adopted for the glycerite of hydrastis.

I shall now take up the individual assays in the order they occur in the U.S.P.

ACONITUM.—As said before, the assay method is unworkable. Even if it worked it is unnecessarily complicated.[1]

BELLADONNAE FOLIA ET RADIX.—This assay method requires only a few modifications in order to make it simple and exact.

(1) The percolation ought to be continued to exhaustion, as indicated by Wagner's reagent.

(2) The cause of error liable to result from transferring of the "creeping" ethereal mixture from one vessel to another and the

---

[1] See paper read by the author at the meeting of the A.Ph.A., 1906, entitled "Some Alkaloidal Assays." (This JOURNAL, p. 458.)

adhering of drug particles to the sides of the first vessel could be completely eliminated by carrying out the shaking and the percolation in one and the same vessel specially constructed for that purpose.[1]

(3) As these drugs are rather poor in alkaloid, at least 20 grammes of the leaves or the root ought to be taken for the assay.

CINCHONA.—Instead of "a mixture of 125 c.c. of ether and 25 c.c. chloroform" the directions ought to be "150 c.c. of a mixture of 5 volumes of ether and 1 volume of chloroform previously prepared and cooled to the ordinary temperature." As on mixing ether and chloroform there is a rise in temperature and contraction of volume,[2] the 100 c.c. drawn off afterwards at ordinary temperature for the assay will from both causes represent more than 10 grammes of drug.

It seems to me that it would be better to use for the assay of cinchona the same method which is used for belladonna root and thus avoid taking an aliquot part of ethereal liquid.

The pharmacopœia directs to make up the final liquid to 50 c.c. and use half for the estimation of total alkaloids, the other half for that of quinine. It would be more convenient to pipette off 20 c.c. (representing 4 grammes of drug) for each of these estimations. As the drug is quite rich in alkaloids there is no disadvantage in working upon 4 instead of 5 grammes of it.

COCA.—The percolation ought to be carried to exhaustion as indicated by Mayer's reagent, and by using the special tube mentioned under belladonna the transferring of ethereal liquid from vessel to vessel could be avoided.

COLCHICI CORMUS ET SEMEN.—The use of the shaking-tube would be advisable.

On comparing the methods for the corm and the seeds it will be seen that in the case of the corm the colchicine before it is weighed undergoes an extra purification. If this is desirable in the case of the corm it ought also to be used in the case of the seeds.

CONIUM.—The assay method is very complicated and will hardly give concordant results in the hands of different chemists.

EMPLASTRUM BELLADONNAE.—It would be preferable to introduce the plaster cut into strips into a separating funnel for the extraction

---

[1] See AMERICAN JOURNAL OF PHARMACY, 1905, p. 463.

[2] *J. Chem. Soc. Trans.*, 1897, 371.

with chloroform. When completely extracted the strips could be removed by means of a hooked copper wire.

Extractum Belladonnae Foliorum.—It would be preferable to put an indefinite amount of extract into a tared separating funnel and determine the amount of extract taken by weighing the funnel together with the extract.

Extractum Colchici Cormi.—The assay could be simplified by weighing the extract directly into the separating funnel and, after adding ammonia, shaking out the colchicine with chloroform or a mixture of chloroform and ether. The assay could then be finished in the way given in the pharmacopœia.

Extractum Nucis Vomicae.—Here again the extract ought to be weighed directly into the separating funnel.

Before the removal of the last trace of chloroform from the final residue containing the strychnine a few drops of amyl alcohol ought to be added and the liquid evaporated to dryness by blowing air over the surface of the vessel while the latter is kept on the water-bath. Otherwise there is liable to be loss of alkaloid by decrepitation. As this simple device effectively prevents decrepitation it ought to be adopted.

Extractum Physostigmatis.—The method is unnecessarily complicated and could easily be replaced by a simpler one.[1]

Extractum Scopolae et E. Stramonii.—The remarks given under extractum belladonnae foliorum apply also to these extracts.

Fluidextractum Aconiti.—As said before, this assay is unworkable. The remarks given under aconite apply also to its fluid extract.

Fluidextractum Belladonnae Radicis.—The method is good and could be made still better by shaking out the first chloroformic solution once or twice more with acidulated water.

Fluidextractum Cinchonae.—A method similar to the one used for belladonna fluid extract would be preferable.

Fluidextractum Cocae.—The assay method is very good, but could still be improved by shaking out three times with ether instead of twice.

Fluidextractum Colchici Seminis.—The assay method is very good.

---

[1] See footnote to aconite.

Fluidextractum Conii.—The remarks on conium apply also to its fluid extract.

Fluidextractum Guaranae.—Method very good.

Fluidextractum Hydrastis.—The method can hardly be improved.

Fluidextractum Hyoscyami.—Same remarks as under fluid extract of belladonna root.

Fluidextractum Ipecacuanhae.—As said before, I find the method unworkable.[1]

Fluidextractum Nucis Vomicae.—The evaporation of the alcohol from the fluid extract is unnecessary. The method can be made much simpler by shaking out directly 10 or 5 c.c. of the fluid extract with inmiscible solvents in presence of alkali.

With regard to the addition of amyl alcohol see extract of nux vomica.

Fluidextractum Pilocarpi.—The method is unnecessarily complicated and could be very easily replaced by a simpler one.

Fluidextractum Stramonii.—Same remarks as under fluid extract of belladonna root.

Guarana.—The method is very good.

Hydrastis.—Use of percolator shaking-tube mentioned under belladonna would be advantageous.

Hyoscyamus.—Same remarks as for belladonna leaves.

Ipecacuanha.—Use of percolator shaking-tube would be advisable.

Nux Vomica.—Same remarks as for ipecac. For the use of amyl alcohol see extract of nux vomica.

Physostigma.—Same remarks as for ipecac.

Pilocarpus.—Same remarks as for ipecac.

Scopola.—Same remarks as for belladonna leaves.

Tinctures.—As by concentration tinctures are converted into fluid extracts, the remarks concerning the latter also apply to the tinctures.

Northwestern University School of Pharmacy.

---

[1] See footnote to aconite.

SOME ALKALOIDAL ASSAYS.[1]

By H. M. Gordin.

While most of the methods adopted in the U.S.P. of 1900 for the alkaloidal assay of drugs and galenicals are very good, there are a few among them that either do not work at all or are so complicated that they will hardly ever give concordant results in the hands of different chemists. To the first class belong the assays of aconite root, its fluid extract and the fluid extract of ipecac. In these assays we are directed to filter the first acid liquids obtained in the method, but as these liquids are very thick and slimy they soon clog up the filter and the assays cannot be finished.

To the second class belong several assays which by introducing certain modifications into the pharmacopœial methods, or replacing the latter by others, could be made simple and capable of giving concordant results.

Such, for example, are the assays of extracts of physostigma and conium and a few others. I therefore propose the following methods which can also be applied to many other cases and which, particularly when used in combination with the shaking-tube percolator described in a previous paper (American Journal of Pharmacy, 1905, p. 463) and the two special separating funnels described below, will be found to be simple, short and exact. While the principles in some of these methods are not strictly new, I do not know of their ever having been used in the way here described.

These principles consist in avoiding the distillation of ethereal solutions to dryness and the substitution of fixed alkali or alkali carbonate for ammonia for the liberation of alkaloids from the aqueous solutions of their salts. While in pure condition most alkaloids can be dried without decomposition, in presence of impurities which always accompany the alkaloids obtained in drug assays, the alkaloids frequently become partially resinified when their ethereal or chloroformic solutions are distilled to dryness and are then difficultly soluble in dilute acids without the use of heat. The heat in presence of free acid is liable to injure many alkaloids. In order to avoid the distillation of ethereal solutions of alkaloids to dryness, the latter can be directly shaken out with excess of standard acid provided

---

[1] Read at the meeting of the American Pharmaceutical Association, September, 1906, and contributed by the author.

no other basic substance is present in the ethereal solution. If ammonia be used to set the alkaloid free there will be large quantities of the volatile alkali in the ethereal solution and the latter will have to be distilled to dryness or at least to small bulk in order to remove the last trace of ammonia which, having a much smaller molecular weight than most alkaloids, would, if not completely removed, vitiate the results obtained by residual titration. But if instead of ammonia sodium carbonate or sodium hydroxide be used for liberating the alkaloids, we can always make use of such an immiscible solvent which does not take up any trace of fixed alkali and which will, therefore, contain no other basic substance except minute traces of ammonia formed by the action of the fixed alkali upon the albuminous matter of the drug. Such traces of ammonia can be easily and quickly removed either by drawing air over the surface of the ethereal liquid or more quickly by concentrating the ethereal solution upon a warm water-bath to about one-half of its original volume. As immiscible solvent in these methods ether alone cannot be used because, dissolving water, ether takes up some fixed alkali when shaken with an alkaline solution. But if instead of ether alone, chloroform alone, or a mixture of three volumes of ether and one volume of chloroform, or a mixture of two or three volumes of ether and one volume of petroleum, ether be shaken up with a solution of a fixed alkali no trace of alkali goes into the immiscible solvent even if the alkaline solution contains 50 or 60 per cent. alcohol. This can be shown by filtering the immiscible solvent, after shaking it with the alkaline solution, through a plain filter of ordinary [1] filter paper, having four folds on each side and previously moistened with ether, and then shaking up the ethereal liquid with a little water. Neither phenolphtalein nor any other delicate indicator will show the presence of alkali in the aqueous liquid.

In using these assay methods ordinary vessels may, of course, be used. But the sources of error involved in transferring ethereal liquids from one vessel to another can be eliminated by making use of the two following special separating funnels.

By means of separating funnel No. 1 aqueous and ethereal liquids can be drawn off through separate outlets and the contamination of

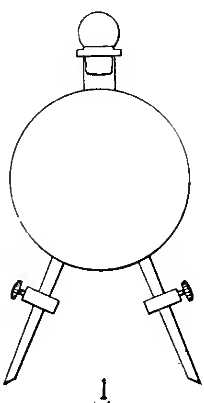
---

[1] Ordinary filter paper is a better absorber of moisture and therefore of traces of adhering alkali than the filters used for quantitative analysis.

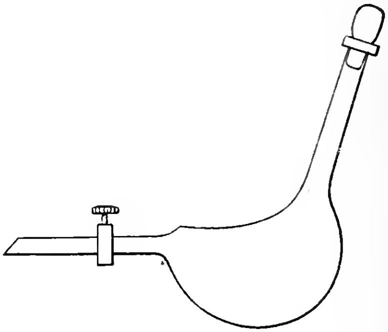
the immiscible liquids by each other completely avoided. By means of funnel No. 2 the concentration of an ethereal liquid can be accomplished by placing the funnel in warm water and connecting the long goose neck with a condenser and thus the transferring of the liquid from a distilling flask to separatory funnel avoided.[1]

ACONITE ROOT.

Put 10 grammes aconite root (No. 60 powder) into the percolator shaking-tube, and 50 c.c. of a mixture of three volumes ether and one volume chloroform and 5 c.c. of a 10 per cent. solution of sodium carbonate. After stoppering the tube shake the whole thoroughly during one hour, then percolate with the same immis-



1



2

cible solvent to exhaustion. In order to obtain a perfectly clear liquid free from any trace of fixed alkali pass the stop cock of the percolator through a very wide cork placed over a small funnel which contains a small plain double filter of ordinary filter paper having four folds on each side. The cork serves as a cover to prevent evaporation. The percolate can be received into any vessel or better into special separatory funnel No. 2. The percolate is then concentrated from warm water to about one-half of the original volume to remove traces of ammonia, and when cold diluted again with ether to approximately the original volume. The ethereal liquid is now shaken out once with excess of standard acid and then twice washed with water. The excess of acid is then titrated in the usual way. As it is always advisable to control the acidimetric

[1] A somewhat similar funnel was devised by H. Bremer.

estimation by a gravimetric one, the acid liquid can be received into a separating funnel of suitable capacity and the titration carried out directly in this funnel. After the titration the liquid is made strongly alkaline with sodium hydroxide and shaken out three times with chloroform. The indicator added all remains in the alkaline aqueous liquid and the colorless chloroformic solution, after evaporation, leaves the alkaloid to be weighed and identified by special reactions. Assayed by this method a sample of good aconite root gave (volumetrically) 1·02 per cent. alkaloids.

IPECAC ROOT.

Put 5 grammes ipecac (No. 60 powder) into shaking tube, add 2·5 c.c. of a 10 per cent. solution of sodium carbonate and 25 c.c. of the same immiscible solvent as was used for aconite. After shaking one hour percolate to exhaustion. Shake out percolate three times with small quantities of very dilute sulphuric acid, add excess of sodium hydroxide and shake out three times with chloroform ether. Distil the ethereal solution to about one-half, dilute with ether to about original volume and finish as with aconite root.

A good sample of ipecac assayed by this method gave 2·55 per cent. alkaloid.

An attempt to assay belladonna leaves by this method showed that the leaves cannot be exhausted if sodium carbonate is used. (Sodium hydroxide was not tried.)

FLUID EXTRACTS.

These were assayed as follows:

From 5 to 20 c.c. of the fluid extract were shaken out three times with the immiscible solvents, using 30, 20 and 20 c.c. and making the liquid alkaline with 10 per cent. solution of sodium carbonate in separating funnel No. 1. The immiscible solvent was filtered into separatory funnel No. 2 and after concentration to about one-half and dilution with ether shaken out with excess of standard acid and then washed twice with water. The excess of acid was titrated in the usual way. The whole volumetric assay of a fluid extract by this method occupies about two hours. The method works very well with the following fluid extracts: Aconite root, belladonna root, coca leaves and ipecac root. For ipecac 5 c.c. and for belladonna root 20 c.c. were taken; for aconite or coca 10 c.c. were taken. As

immiscible solvent a mixture of two volumes of ether and one volume of petroleum ether was used.

The results obtained from samples prepared in our laboratory from drugs of good quality were as follows:

Fluid Extract	Aconite	1·20
" "	Coca	0·76
" "	Belladonna root	0·60
" "	Ipecac	1·80

FLUID EXTRACT PILOCARPUS.

Owing undoubtedly to the solubility of pilocarpine in water and to the tendency of this fluid extract to emulsify, the Pharmacopœia directs to evaporate the fluid extract on sand and then extract the sand with chloroform in presence of ammonia. A much quicker method is as follows: To 10 c.c. of the fluid extract placed in separating funnel No. 1 add 10 c.c. of a saturated solution of potassium carbonate and shake out the liquid three times with a mixture of three volumes of ether and one volume of chloroform, using 40 c.c. each time. Filter the ethereal liquid into separatory funnel No. 2, concentrate to about one-half, dilute with ether and shake out with standard acid. The excess of acid is titrated as usual. A sample obtained from S. and D. gave 0·53 per cent.

FLUID EXTRACT CINCHONA.

Owing again to the tendency of this fluid extract to emulsify the Pharmacopœia directs to mix the fluid extract with ether, chloroform and ammonia and then draw off an aliquot part for the assay. As the use of aliquot parts of ethereal liquids is objectionable, wherever it can be avoided I use the following method:

To 5 c.c. of the fluid extract placed in funnel No. 1 add 2 c.c. of a 10 per cent. solution of sodium hydroxide and shake out three times with a mixture of three volumes of ether and one volume of chloroform, using 25 c.c. each time. Filter ethereal solution into another separating funnel and shake it out three times with dilute sulphuric acid. From the acid solution the alkaloids are extracted with chloroform in presence of any alkali, the chloroform distilled off from a tared vessel and the residue dried and weighed. No emulsion occurs during the process. A sample of fluid extract prepared in our laboratory gave 4·81 per cent. total alkaloids.

EXTRACTUM PHYSOSTIGMATIS.

Having found the pharmacopœial method rather complicated I have used the following method which is short and exact:

Dissolve 2 grammes of the solid extract placed in a small evaporating dish in about 10 c.c. of cold water acidulated with 5 drops of dilute acetic acid (U.S.P.) and transfer the turbid liquid to a 25 c.c. measuring flask. Wash the dish with small quantities of water and make up the liquid to 25 c.c. Filter through a dry filter and by means of a pipette transfer 12·5 c.c. of the filtrate to separating funnel No. 1. To the contents of the funnel add 10 c.c. of a saturated solution of sodium bicarbonate and 100 c.c. of a mixture of one volume of petroleum ether and three volumes of ether. Shake thoroughly for a minute or so, draw off the alkaline aqueous liquid and throw it away, then filter the ethereal solution into separating funnel No. 2 through a plain double filter of ordinary paper having four folds on each side. Wash the first separating funnel and the filter repeatedly with more of the immiscible solvent and concentrate the ethereal liquid to about one-half. Cool, dilute with ether and shake out first with excess of standard acid and then twice with water. Titrate excess of acid with standard alkali, using hematoxylin as indicator. The acid liquid is perfectly colorless and the end reaction is exceptionally sharp.

A higher yield of alkaloid can be obtained by substituting chloroform for the petroleum ether in the above immiscible solvent. In this case, too, the method works well and the end reaction is very sharp. But neither method gives the amount of all the alkaloids in the drug, which could only be obtained by repeated extraction with chloroform. As this is inconvenient the results obtained by either of the above methods could be adopted as official standard.

A sample obtained from P. D. & Co. gave the following results:

	Per cent.
Stated strength	5·00
By first method	4·20
By second method	4·91

The apparatus described in this paper as well as the one described in this JOURNAL, 1905, p. 463, can be obtained from E. H. Sargent & Co., Chicago, Ill.

NORTHWESTERN UNIVERSITY SCHOOL OF PHARMACY.

SEPARATION OF MORPHINE FROM ITS SOLUTION IN GLYCERIN.[1]

By H. M. Gordin.
In collaboration with W. H. Harrison.

Owing to the considerable solubility of morphine in glycerin it is difficult to separate this alkaloid from its solvent. From a 50 per cent. solution of glycerin containing about 250 milligrammes of the alkaloid in 100 c.c. of liquid, morphine is not precipitated by alkaline carbonates. Ether or chloroform do not dissolve glycerin, but neither do they dissolve much morphine. Amyl alcohol is a somewhat better solvent for morphine, but it also dissolves about 8 per cent. glycerin. Hence on shaking out a glycerin solution of morphine with amyl alcohol three or four times considerable glycerin will go along with the alkaloid, and when the amyl alcohol is then shaken out with acidulated water the water will take up both the alkaloid and glycerin.

The first method that suggested itself was to remove the glycerin by a current of steam. It was found that ordinary steam at 100° does not take up any appreciable amount of glycerin. Even superheated steam at 135° takes up very little glycerin.

Steam of a much higher temperature would undoubtedly remove all the glycerin, but it being certain that high temperatures would destroy the morphine during the long time that is required to remove all the glycerin the method was dropped.

The second method was to mix the glycerin solution of morphine with about ten times its amount of lead oxide, heat on the water-bath to perfect dryness and extract the morphine repeatedly with hot amyl alcohol. From the latter the alkaloid could then be extracted by means of dilute acid. While this method looked promising at first the results were entirely negative. Not a trace of morphine was recovered. Either the alkaloid is destroyed by the heating on the water-bath with the lead oxide or, what is more probable, morphine having a phenolic character forms a lead salt with the metallic oxide, which salt is completely insoluble in hot amyl alcohol.

---

[1] Read at the meeting of the American Pharmaceutical Association, September, 1906, and contributed by the author.

The next method tried was to dilute the glycerin solution of morphine with a saturated solution of potassium carbonate and then shake the liquid out three times with hot amyl alcohol. From the amyl alcohol the alkaloid was extracted by shaking out three times with small amounts of dilute sulphuric acid. By this method some morphine was recovered, but the amount was very small. As the method is very inconvenient with larger quantities of liquid and the results are poor, this method, too, is certainly very unsatisfactory.

The best results were obtained by the following method: The glycerin solution of morphine sulphate is treated with an excess of normal iodine solution and the liquid diluted with water to about three times the original volume. On standing over night about 80 per cent. of the morphine taken crystallized out as the characteristic morphine hydriodide triiodide. The crystals were collected upon a small filter, washed with water containing a little Wagner's reagent and then dissolved by adding a few cubic centimeters of a 10 per cent. solution of sulphurous acid.

In this way even starting with a very large amount of a glycerin solution of morphine the alkaloid is finally obtained in only a few cubic centimeters of an aqueous liquid perfectly free from glycerin. On now adding a slight excess of potassium carbonate and heating to about 100° for a minute or two the alkaloid commences to crystallize out within half an hour.

Northwestern University School of Pharmacy.

THE DUTY OF THE PHARMACIST TO AID IN THE ELIMINATION OF IRREGULAR PRACTICES.[1]

By Charles H. LaWall.

In the consideration of the above subject, it will first be found necessary to briefly review and define some of the acts which would justly be entitled to the term irregular.

Irregularity in its strictest sense means, contrary to the ethics of the professions of medicine and pharmacy, but in the broader signi-

---

[1] Read before the Philadelphia Section of the American Pharmaceutical Association, May 21, 1906.

fication which is accepted by the most advanced thinkers, it is taken to mean any practice which is detrimental to the community at large, or which conflicts with or hampers scientific progress in either of the professions.

In a classification of this kind there may be mentioned three forms of irregular practice which directly affect the health of the community, and which are to be deplored by all members of the pharmaceutical profession who have a true understanding of the relation which they bear to the public from whom they derive their privileges and powers.

Counter-prescribing, the dispensing of drugs used for improper purposes, and the intentional promoting and fostering of drug habits are not so common at the present time as they were before the recently established era of association work, and higher educational facilities, and ideals produced their undeniable influence, but they are too common to suit the trustworthy and law-abiding members of the profession, and are persisted in by a small number of druggists, who in so doing cast discredit upon all their brethren, and prevent the establishment of mutually helpful relations between the members of the professions of medicine and pharmacy.

The blame for counter-prescribing may be placed directly on the shoulders of the public itself; the same causes leading to it which have contributed to the abuse of the free dispensary, chief among which is the desire to get something for nothing.

In the case of counter-prescribing, there is a limit within which the dispensing of certain simple remedies is undoubtedly justifiable. When a customer enters a drug store and asks the proprietor or clerk for a mild purge or a lotion for a slight sprain, it is certainly within the province of the pharmacist to dispense such an article as is described—but when certain symptoms are described and the druggist is asked for a remedy to correct or cure such symptoms, it is unmistakably wrong for him to assume such responsibility even though he receives no compensation for his advice.

The false confidence which leads some druggists into the erroneous idea that they are qualified to prescribe is probably due to familiarity with the methods of the many physicians whose prescriptions are daily compounded and closely observed. The druggist becomes imbued with the idea that, because Dr. A., Dr. B., and

Dr. C., all prescribe similar combinations for symptoms which have in many cases been confided to him by the patient previous to consulting the physician, he knows just as much about prescribing for such symptoms as they do.

It is also true that many physicians are guilty of the weakness of falling into a rut in prescribing, having a stock or pet form of prescription which they use day after day with minor variations, and to this procedure is ascribed the origin of many compound preparations which afterward become officially recognized, as Dover's Powder, Basham's Mixture, Donovan's solution, etc., and in some cases, doubtless, these oft-repeated prescriptions have been taken up and exploited as proprietaries or nostrums to the detriment of both professions.

It is also true that some teachers in medical colleges are faddists or cranks on certain combinations, and that all teachers publish in their text-books and exhibit in their lectures typical prescriptions for illustrative cases, which prescriptions are primarily intended for the guidance of the beginner in prescription writing, but which are too often used as written, with little or no modification, during the entire professional career of the student.

In a recent number of a pharmaceutical journal was published a list of such prescriptions, to which were appended the names of the prescribers, most of whom were eminent in the profession of medicine, together with the name of the disease or the purpose for which the combination was prescribed. A glance at some of them will show how errors may thus be perpetuated, and harm done to both medicine and pharmacy, and it is not beyond the bounds of possibility that some nostrum manufacturer might take any one of them and put it up as a secret preparation, stating with entire truthfulness that it had been used and advocated by a prominent member of the medical profession in the alleviation or cure of a given condition.

There is one phase of counter-prescribing, however, which must be unhesitatingly and emphatically condemned, *i. e.*, the prescribing for eruptive symptoms or conditions under the supposition that they are merely local. Such symptoms in many cases are indicative of contagious disease, and ill advised or irregular treatment by an inexperienced person may easily result in the detention or even to the death of more than one person.

It is unnecessary to condemn, before an audience of this kind, the other two forms of irregular practice which have been mentioned; they are only persisted in by a small proportion of the members of the profession, *i. e.*, that proportion which never allies itself with any associations nor attends meetings where such subjects come up for discussion, and in whom the moral sense is so blunted that they would be guilty of dishonest practices in whatever business or profession they happened to be placed.

There are, however, certain irregularities to which the pharmacist is often an unwilling contributor, and the elimination of which will be brought about by a proper understanding of the conditions which exist. I refer to the matters which come under the jurisdiction of the Council of Pharmacy and Chemistry of the A.M.A.

The Council of Pharmacy and Chemistry and its work needs no explanation to most of the members present. It was formed for the purpose of disseminating information concerning a large number of preparations, some of which are worthy and others unworthy or fraudulent, and whose number is so large that the ordinary practitioner cannot spare the time to look into the merits of each individual preparation himself. The committee consists of fifteen members who stand among the highest in the professions of medicine and pharmacy in the country. They have formulated certain rules to which preparations must conform in every respect in order to meet with the approval of the committee. The results of the investigations as far as accepted or admitted articles are concerned will be published in book form at a nominal price, to serve as a guide or handbook of unofficial and legitimate preparations in common use. It is to be regretted that there has been no provision for publishing in the same book the facts and information in such cases where the preparation has not been found worthy of admission, for it is just as important to know what not to prescribe as it is to know what is proper to give.

In connection with several of these rules the pharmacist, by virtue of his special knowledge along these lines, is well qualified to aid the members of the medical profession in this great work.

Rule 2 provides that "No chemical compound will be admitted unless information be furnished regarding tests for identity, purity and strength, and, if a synthetic compound, the rational formula."

The pharmacist, by his training in theoretical organic chemistry

and his practical experience in analytical work, is well qualified to aid in the separation of the wheat from the chaff in the numberless preparations which will have to be tried by this rule. The claims of manufacturers are often so ingeniously worded, that one who is not familiar with the manner in which organic chemical names are capable of being juggled or transposed, may be easily deceived.

Rule 4 states that "No article will be admitted whose label, package or circular accompanying the package contains the names of diseases, in the treatment of which the article is indicated. The therapeutic indications, properties and doses may be stated. (This rule does not apply to vaccines and antitoxins, nor to advertising in medical journals, nor to literature distributed solely to physicians)."

As the physician frequently has no opportunity of seeing the package as it occurs in the trade, and, as has happened occasionally, that the literature as sent to physicians does not entirely agree with that accompanying the package, the assistance of the pharmacist in correctly establishing conformity with this rule will be found to be indispensable.

Rule 5 says that "No article will be admitted or retained about which the manufacturer or his agents make false or misleading statements regarding the country of origin, raw material from which made, method of collection or preparation."

The pharmacist's familiarity with the origin of the crude drugs, his knowledge of the variations and changes in botanical nomenclature and his acquaintance with the methods whereby combinations are effected, give him a peculiar advantage in assisting the correction of errors or misstatements of this kind. As an example of what is possible in this respect: the botanical name of cimicifuga has been successively changed from Macrotys racemosa to Actaea racemosa and that to the present form of Cimicifuga racemosa. It would be quite possible to make a palatable preparation of cimicifuga and exploit it under the obsolete title of Macrotys, referring to it as "an indigenous drug of unusual value in the treatment of certain nervous affections" and thus impose upon a large proportion of medical practitioners who are not aware of the manipulations to which botanical nomenclature may be subjected.

An example of a misleading statement recently came under my personal observation in the case of a cosmetic cream which was claimed to be made from the paste of the seeds of a rare and won-

derful Oriental tree, and which revealed the fact, on analysis, that the basis of the preparation was a stearic acid soap, and that it could be duplicated for less than 10 cents a pound, while the preparation with its high-sounding title and extravagant claims was sold at the price of 50 cents for a 2-ounce jar, or $4.00 a pound—truly a handsome margin for containers, labels and profit.

Rule 8, which requires that "Every article should have a name or title indicative of its chemical composition or pharmaceutic character, in addition to its trade name, where such trade name is not sufficiently descriptive," is another of the rules in which the pharmacist is peculiarly well qualified to judge, on account of his knowledge of materials and processes.

If one-half the energy which is now devoted to the making of a few extra cents on nostrums, which in most cases are objectionable or dangerous, could be applied to the elimination of some of the evils which have crept into the profession through the inefficiency and unscrupulousness of a small minority, it would result in the establishment of an entente cordiale between the physician and pharmacist which would increase public confidence, open new avenues of legitimate profit, and bring about a condition which should never have been interrupted or suffered to lapse as has unfortunately been the case.

ACETONE COLLODIONS.[1]

By George M. Beringer.

In a paper read before the Philadelphia College of Pharmacy in February, 1892, the writer called attention to the remarkable solvent power of pure acetone, and predicted that in the future it would be found a useful solvent in pharmacy and chemistry. (American Journal of Pharmacy, 1892, fol. 147.) This prediction is fast being realized, and in the Eighth Decennial Revision of the U. S. Pharmacopœia it has been officially recognized and directed to be used as a solvent in the preparation of the official oleo-resins, with the exception of the oleo-resin of cubeb. Its solvent power for oils, resins, waxes, etc., has likewise greatly extended its use in the arts and manufactures.

---

[1] Read at the Meeting of the American Pharmaceutical Association, September, 1906.

The use of acetone in certain lacquers suggested its application to the preparation of collodions. Several of the so-called "liquid court plasters" now on the market contain this as a main ingredient. The intent of this paper is to publish formulas that appear to be satisfactory, without going into the details of a greater number of experiments. Suffice it to state that the simplest formulas have yielded the best results.

ACETONE COLLODION.

Take of—

Pyroxylin	5 grammes.
Camphor	1 gramme.
Acetone, a sufficient quantity to make	100 cc.

Dissolve the pyroxylin and camphor in a clean bottle with 90 c.c. of acetone and, after solution has been effected, add sufficient of the acetone to make the product measure 100 c.c. If the pyroxylin is of a good quality the solution will be prompt and perfect, otherwise it will be necessary to permit the liquid to stand until it has become clear and then decant.

Acetone collodion, as thus made, evaporates a little more slowly than the official alcohol-ether collodion, but it yields a much stronger film, which is transparent, adheres closely to the surface and is flexible without the addition of other materials. In the writer's opinion this preparation possesses advantages over both the official collodion and flexible collodion, and should displace both officially, and render the latter title unnecessary. Acetone collodion, likewise, makes an elegant basic preparation for the application of the aromatic phenols, iodine, iodoform, etc., and a number of such medicated collodions are readily prepared and are very satisfactory.

ACETONE CANTHARIDAL COLLODION.

Take of—

Cantharides in No. 60 powder	60 grammes.
Pyroxylin	4 grammes.
Camphor	1 gramme.
Acetone, a sufficient quantity.	

Moisten the cantharides with 35 c.c. of acetone, and pack in a cylindrical percolator. Close and cover the percolator and macerate for 24 hours, then percolate slowly with sufficient acetone until exhausted. Reserve the first 80 c.c. of percolate and evaporate the remainder at a low temperature (55°—60° C.) to a soft extract.

Mix this with the reserve and dissolve the pyroxylin and camphor in the mixture. Finally add sufficient acetone to make the volume 100 c.c. If not entirely clear set it aside in a cool place until it becomes clear by settling, and then decant.

This product is a clear, green-colored liquid, and possesses strong vesicant action. The camphor present is not objectionable, and its mildly stimulating effect is rather an aid to the action of the cantharides.

STYPTIC COLLODION.

The official formula for styptic collodion does not as a rule yield a clear solution of the tannic acid promptly.

Experiments with the acetone have not been satisfactory, a difficulty presenting itself which had not been anticipated or yet satisfactorily solved. While tannic acid is readily soluble in acetone to the extent officially directed (20 grams in 100 c.c.), yet when pyroxylin is added to the solution there is formed a coagulum which consists of most of the cotton associated with tannic acid. The experiments seem to indicate that acetone is not suited for the preparation of styptic collodion.

Samples of the acetone collodions produced by these formulas are presented and also samples of acetone collodions medicated with iodine and iodoform to the extent of 5 per cent.

EDUCATION AND LEGISLATION IN PHARMACY.[1]

By Oscar Oldberg.

A year ago you summoned me to perform the duties of chairman of this Section. These duties, as I understand them, consist chiefly in the presentation of facts and conditions which more than others seem to require our attention. I have endeavored to prepare myself for this task by studying as well as I could the most obvious present conditions and needs of our profession, the laws under which we practice it, the manner in which these laws are enforced, our standards of education, and the means by which the necessary training for the practice of pharmacy may be secured. It has been a diffi-

[1] Abstract of address of the chairman of the Section on Education and Legislation of the American Pharmaceutical Association, September, 1906. The portion on Pharmacy Laws will appear in a later issue.

cult task and I shall call your attention to only a few of the problems which I believe we are called upon to solve.

Our Relations to the Public.—Pharmacists stand in a peculiar relation to the public. This relation is too generally overlooked or ignored, or it is recognized only in a onesided fashion.

We are all willing that the practice of pharmacy shall be restricted to our hands—that none but pharmacists shall be permitted to prepare, dispense or sell medicines to the public, but we are delinquent in paying the price. Pharmacy laws have been enacted by which the people say to the pharmacist: in consideration of the protection afforded the public health by your special education and skill and your faithful service the exclusive right to sell drugs and medicines shall be yours.

In fact the people have virtually turned over to the pharmacists themselves the regulation of the practice of pharmacy, so that we are put upon our honor in carrying out our end of the contract.

The question we must be able to answer to the satisfaction of the people is this: What are the results of our administration? If these results are plainly unsatisfactory and it is found that the rights of the public and the medical profession are not reasonably satisfied, then will our stewardship be taken from us.

The public generally believes that all druggists are required by law to be competent pharmacists. But the pharmacy laws are such that if our pharmacists were not in fact better educated than these laws require them to be the public would be without that protection which it demands.

The agitation of the quack-nostrum evil, the enactment of pure food and drug laws, the public awakening to the abuse of habit-producing drugs—these and other topics of the day must sooner or later place the pharmacy laws and the practice of pharmacy in the lime light. The public will then discover the wretchedly low legal standards of education for the practice of pharmacy and will inevitably proceed to change them without consulting us. The changes may be drastic. Shall we follow the example of the meat packers and let the storm overtake us unprepared, or shall we put our house in defensible order?

The Attitude of the Druggist toward Better Education.—Druggists complain that their business is highly unsatisfactory. Competition is excessive. Profits are small. Expenses are heavy. They say

there is no longer any scientific or technical work for the pharmacist to do. Many of them laugh at the idea that technical education is necessary in their business. They declare that higher educational requirements only increase their expenses by diminishing the supply of clerks.

I am sure the real evils we suffer from can be remedied to a great extent by a reasonable interpretation and enforcement of most of our existing laws.

It is impossible to prevent excessive competition in the drug business except by establishing higher educational requirements for the license to open or conduct a pharmacy, while the remedy for the scarcity of drug clerks lies in a rational recognition of the difference between principals and clerks. We cannot eat the cake and keep it, too. Every pharmacy law which recognizes only one class or grade of pharmacists must inevitably work injury to the public as well as to the pharmaceutical profession, for if the standard of education under such a law is high enough to really check the multiplication of drug stores a scarcity of clerks will be the unavoidable result, whereas, if the educational requirements for license are low enough to provide an abundance of clerks, these clerks will rapidly become proprietors by starting new stores. Every pharmacy law should, therefore, recognize both principals and clerks and should establish higher educational qualifications for the license which confers the right to open or conduct drug stores than for a license to practice as an assistant or clerk.

But we find that in States where the pharmacy laws do make a distinction between registered pharmacists and registered assistant pharmacists there is nevertheless an excessive number of pharmacists and a ridiculously small number of assistants. The reason must be that it is too easy to secure the higher license. Many State Board members have begun to realize this and are striving to "make the examinations stiffer."

I want to call your attention to a few facts. To make these facts clearer I shall call registered pharmacists "druggists" and assistant pharmacists "clerks." Do you know that in the State of Indiana there are nearly two druggists to every drug store and about one-fifth of one clerk? In Illinois two druggists and one-third of a clerk. In Ohio one and one-half druggists and one-third of a clerk. Not one State have I found in which the proportion of assistant

pharmacists bears a rational relation to the number of drug stores. Not one in which there are not too many registered pharmacists ready to open up new drug stores as soon as they have a chance. These conditions should be radically changed.

Compulsory graduation in pharmacy as a requirement for full license would of course serve as a check upon the increase of drug stores. Nothing else will. At the same time that is also the very thing required to satisfy the demands of the public and the medical profession. But a large number of druggists are apparently as afraid of so-called "prerequisite laws" as women are of mice. They must be blind as well as over-timid.

Am I My Brother's Keeper?—We all suffer from the reproach which our low standards of education invite. The fact that the membership of the American Pharmaceutical Association consists of pharmacists of a high order does not suffice to protect the profession as a whole from that reproach. The public and the medical profession will judge us by our laws and by the attitude of druggists in general toward better education. That our State pharmaceutical associations repeatedly vote down every proposition to increase the educational requirements in any degree brings odium upon us all. We are all bound up together. The rule "every one for himself" will not do. You are your brother's keeper whether you will or not.

The Relations between Physicians and Pharmacists.—Pharmacy as a distinct occupation will never cease to exist. Scientific pharmacy is indispensable to scientific medicine. Physicians and pharmacists who do not thoroughly recognize that truth have not studied the question.

For a generation the physicians have been weaned away from the pharmacists. They forgot that all really tried and useful drugs are either already in the pharmacopœias or sure to be included in them as soon as definitely known or recognized. There were several reasons why physicians so extensively prescribed ready-made remedies and combinations of remedies instead of writing prescriptions for these same remedies in the well-known officially recognized forms and ordering their own proportions and combinations, leaving the task of dispensing and compounding to the pharmacist. You know the whole story well.

But we should never forget that the chief reason why so many physicians deserted the pharmacists was defective education. Ignorant

and thoughtless persons are to be found in all pursuits, including the "learned professions." Ignorant, poorly educated or thoughtless physicians do not understand and appreciate the value of the services of competent pharmacists. The services of ignorant and incompetent pharmacists have no value.

Highly educated, high-minded, conscientious physicians who were unconsciously led into prescribing ready-made medicines and proprietary preparations in no way superior to the drugs and preparations of the pharmacopœia have had their attention called to the pitfalls and uncertainties of such a practice and have entered upon a vigorous reform movement which specifically promises and includes the employment of the pharmacist's services to a greater extent hereafter than ever before.

Shall we not meet these physicians more than half way? Shall we be caught napping? Shall we not clean house and welcome them? If they find that the ranks of pharmacy are recruited from the primary schools and that no professional education is required for the practice of pharmacy, they will be compelled to turn from us in disgust and dismay. They will, of course, inquire what the certificate of registration and license to practice pharmacy is worth—what it means, what protection it gives. We cannot expect them to become personally acquainted with the pharmacists so as to know of their own observation and experience whom they can afford to trust and then to compel their patients to patronize no others.

It will do us no good to tell the physicians that while our pharmacy laws do not prescribe any education they do prescribe examinations. Examination is not education and can never take its place. If you say that the purpose of the examination is to discover the education, and that education is what you really want, the rejoinder of any sane man must be: If education is what you want why do you not say so in a direct and definite way? Why do you beat around the bush? Why do you not walk in at the front door instead of trying to crawl in through the chimney? If you honestly want to exclude from the pharmaceutical profession all men who do not have enough education to make that profession respectable and respected, why do you persistently oppose even such a palpably low standard of preliminary general education as one year's high-school work?

Physicians are reasonable when they say that high school gradu-

ation is not too much to ask of all who propose to become pharmacists. They are more than justified in saying that to admit primary-school boys to the ranks of the pharmaceutical profession is conclusive proof of utter contempt for the rights of the public and the medical profession and a sad evidence of the low estimate which pharmacists themselves place upon the importance of their services.

Prof. William Procter, Jr., whose memory we are specially honoring at this meeting, was an earnest advocate of better preliminary education for the apprentices in drug stores. Yet, the apprentices of his day were of a higher grade educationally than those of to day.

The opposition to respectable educational standards comes largely from the so-called "self-made" men who boast that they succeeded without education. They are no doubt sincere. But a self-made man often has a too high opinion of his own value and power and a too low opinion of those who are better equipped than he. If the want of education insures success then the self-made man has nothing to boast of. The self-made man who is really great and strong is he who fully realizes how much stronger he would have been if he had not been self-made.

Intelligent men want neither self-made physicians nor self-made pharmacists.

Our Schools of Pharmacy.—At this writing we have probably eighty-seven schools of pharmacy. There have been several births and deaths during the past year.

An excessive number of educational institutions is not an unmixed blessing.

Here in the State in which we are holding this meeting there are five pharmaceutical schools. In Ohio there are eight. It is impossible that eight pharmaceutical schools can be required and maintained in a condition of reasonable efficiency in any one State.

I have no recommendation to make in regard to this embarrassing wealth of educational machinery, but will say that the Boards of Pharmacy have the power and means by which schools that are unable or unwilling to give good and sufficient courses and which are not properly equipped and do not have reasonably sufficient resources or means of support may be denied that recognition which is clearly due under the pharmacy laws to all efficient schools.

Many of our schools of pharmacy have fine buildings of their own, or less pretentious but still adequate homes. Others are well housed by universities and other institutions. Several of our pharmaceutical schools have a long and honorable record. Several have faculties composed of men of national reputation Several have ample equipments. Several give very substantial courses of instruction of a high grade.

Let us not commit the unpardonable sin of ignoring or losing any of these advantages. Let us foster right education. Let all schools that have any good in them do their best. Let the Boards of Pharmacy take a year, if need be, to learn the facts about our schools and give positive aid and encouragement to them. Let the Boards consult them all. Let no mistakes be made. Let all have a square deal.

The Pure Food and Drug Law.—The National Pure Food and Drug Law passed by Congress this summer contains several features of vital interest to pharmacists. In the first place it specifically recognizes the Pharmacopœia of the United States and the National Formulary. This recognition of the Pharmacopœia and Formulary should prompt us in the future revisions of these two works to carefully consider their added importance. One of the most desirable reforms in this connection would be to eliminate from the Pharmacopœia all formulas for therapeutic combinations and remedies containing two or more different therapeutic agents, and to include all such remedies in the National Formulary, while the Pharmacopœia should include all simples and all substances of definite chemical composition together with galenical preparations representing single drugs.

One regrettable feature of the Pure Food and Drug Law is the proviso that the titles of the Pharmacopœia and National Formulary may be used in the sale of articles not conforming to the standards of those authorities provided the seller indicates the deviation. It is fortunate that the law as passed does not contain the absurd proviso that morphine, cocaine, etc., may be sold freely without indicating the composition on the package provided the percentage of poison falls below a certain stated limit. Any thinking man must recognize that the presence of a sufficient quantity of any habit-producing drug in any preparation to give any effect whatever must carry with it the habit-producing effect, and that if a smaller quantity

is contained in the preparation it might as well be omitted altogether. Moreover, no matter how small the per cent. of cocaine or morphine the preparation may do just as great harm because the doses taken may be multiplied.

The new law regulating the practice of pharmacy in the District of Columbia contains this absurd proviso, but I suppose that the new Pure Food and Drug bill, which is of later date, annuls that feature of the law applying exclusively to the District of Columbia.

The Section on Pharmacology and Therapeutics of the American Medical Association.—The chairman of the delegation from the American Pharmaceutical Association to the Section on Pharmacology and Therapeutics of the American Medical Association, Mr. H. P. Hynson, of Baltimore, delivered an address at the annual session of the Association, June 5th, in which he set forth the relations of the pharmacist to the medical profession in an admirable manner. Dr. Hynson's address is published in the August number of the *Bulletin* of the American Pharmaceutical Association.

Surely the American Pharmaceutical Association should continue to utilize this means of annual communication with the American Medical Association to cultivate a better understanding of the duties of pharmacists toward medicine and of the physicians toward pharmacists. Never before within my recollection has the time been more auspicious for cordial co-operation between the medical profession and the pharmacists of the country because the desire of the physicians to again make full use of the services of the pharmacists is strong and clear.

Proprietary Remedies.—The American Medical Association, as you know, has undertaken in an effective way the investigation of the merits and character of proprietary remedies. It has established a Council on Pharmacy and Chemistry composed of physicians, pharmacists and chemists of the highest standing which is doing very valuable work. I strongly recommend that the American Pharmaceutical Association place itself on record as in hearty sympathy with this movement and that it recommend to the schools of pharmacy active co-operation in the work of the Council. Members of the Faculties of the schools and their post-graduates can do a considerable amount of work with the facilities the schools have at their disposal, and many members of the American Pharmaceutical Association are doubtless able to lend assistance in the same manner.

In Conclusion.—I have endeavored, with the help of my associates, to formulate certain general principles which seem to require discussion and action. These propositions have been circulated among the members of the American Pharmaceutical Association, the Boards of Pharmacy and Pharmaceutical Schools, and unless the printed matter so circulated has gone to the waste basket we shall be prepared to do some actual work at these meetings.

The programme is before you, and although the novelty of its features must have worn off, I appeal to you to go through the whole programme, dry as it may seem, as a matter of duty to the whole body of pharmacists in this country and I trust further that our deliberations will be free from the friction which is often generated by differences of opinion. Let us all be governed by the one desire to further the welfare of our fellowmen and the true interests of our ancient and honorable calling.

THE AMERICAN PHARMACEUTICAL ASSOCIATION. FIFTY-FOURTH ANNUAL MEETING.

By M. I. Wilbert.

The fifty-fourth annual meeting of the American Pharmaceutical Association, held in the city of Indianapolis, Ind., September 3–8, 1906, will long be remembered by those who had the privilege of being present, as a meeting fraught with possibilities that fully came up to, if not exceeded, the fondest expectations of the friends of American Pharmacy.

It is undoubtedly true that there have been meetings that were more numerously attended, and also meetings at which more papers were read and discussed, but it would be difficult indeed to single out any one previous meeting of the Association at which such vitally important subjects as education and legislation were discussed more thoroughly or more satisfactorily than they were in connection with the fifty-fourth annual meeting of the American Pharmaceutical Association. The work of other sections, while fully up to the average, was, for the once, completely overshadowed by the consideration shown to, and the attractions offered by, the program of the section on Education and Legislation. A more detailed account of the work that was done will be given in connection with the report

on section meetings and it will, therefore, suffice to call attention to this particular phase of the meeting in this general way.

First General Session.—The first general session of the Association was called to order in the palm-room of the Claypool Hotel by the president, Mr. Joseph L. Lemberger, on the afternoon of Monday, September 3, 1906.

After the presentation of the usual greetings, and messages of welcome, from local and State officials, the president read the annual address.

In the course of his remarks, which were largely devoted to a review of "what has been accomplished by American Pharmacy," Mr. Lemberger outlined the evolution and development of pharmacy since the organization of the American Pharmaceutical Association and also referred at some length to a number of the contemporaneous changes that have been brought about in other lines of research and industry.

Mr. Lemberger also recounted some of the more interesting and important problems that presented themselves for solution, and called attention to the work that had been outlined for the several sections of the Association.

In conclusion the president offered a number of suggestions or recommendations that he deemed worthy of immediate consideration. Among the more important, he recommended that the American Pharmaceutical Association continue the publication of the *Bulletin;* that the Association endorse the action of the American Medical Association to promote the organization of a department of public health, and also commend and aid in enforcing the recently enacted national pure food and drug law.

This address was, on motion, referred to a committee of three to report at a subsequent meeting.

The poll of members of the nominating committee indicated that members from 26 States and Territories were present on the first day of the meeting of the Association.

Second General Session.—Tuesday, September 4, 1906. After the reading of the minutes of the first general session and the presentation of greetings from affiliated bodies, Prof. Remington presented a letter containing greetings from Dr. S. S. Cohen, a former chairman of the section on Pharmacology and Therapeutics of the American Medical Association.

The portion of this letter referring more directly to the work of the American Pharmaceutical Association was as follows:—

"If I may assume to speak for clinical therapeutics to the representatives of pharmacy, I would say:—

"Gentlemen: I depend on you in my efforts to help my patients, to get them well. I depend on your knowledge, your skill, your science, your enterprise, but above all upon your fidelity. I trust you, you are my armor bearers as I fight disease. If my spear is dull, my bowstring slack, my arrows unfeathered, my sword rusty, my shield pierced, death awaits them that I would protect. But give me weapons that I can depend upon and I go into battle hopefully, with the determination to conquer.

"The efforts that you and your co-workers are making to restore pharmacy to the rank of the learned professions and to advance the status of the pharmacist have my earnest sympathy and my sincere co-operation.

"Let us stand together for clean medicine and upright pharmacy; let us oppose quackery, fraud and pretense within as well as without our ranks. Let the American Pharmaceutical Association join the American Medical Association in its determination that the errors of the past shall be corrected, that the interests of the people, the interests of science shall be our own chief interests; and that all selfish obstructionists shall be silenced or shamed.

"Then we can confidently face the future, sure of what is better than the mere achievement of success—the deserving of it."

The reading of this communication was followed by the report of the delegates from the American Pharmaceutical Association to the meeting of the Section of Pharmacology and Therapeutics of the American Medical Association.

The election of officers resulted in the selection of the following:—

President, Leo Eliel, South Bend, Ind.; First Vice-president, Wm. Mittelbach, Boonville, Mo.; Second Vice-president, C. S. N. Hallberg, Chicago, Ill.; Third Vice-president, Thomas P. Cook, New York, N. Y.; General Secretary, Charles Caspari, Jr., Baltimore, Md.; Treasurer, S. A. D. Sheppard, Boston, Mass.; Reporter on the progress of pharmacy, C. Lewis Diehl, Louisville, Ky. Members of the Council: Joseph L. Lemberger, Lebanon, Pa.; Joseph P. Remington, Philadelphia, Pa.; Charles E. Dohme, Baltimore, Md.

Subsequently I. A. Keith, of Preston, S. D., was elected a

member of council for the unexpired term of Mr. Mittelbach. Thomas P. Cook, New York, was elected Local Secretary.

SECTION ON EDUCATION AND LEGISLATION.

OSCAR OLDBERG, Chairman. JOS. W. ENGLAND, Secretary.

The first meeting of the Section on Education and Legislation was called to order by the chairman on Tuesday afternoon. The first order of business being the address of the chairman this was immediately proceeded with. This address constituted a rather exhaustive review of: "Our relations to the public, the attitude of druggists towards better education, the relations between physicians and pharmacists, our pharmacy laws, the powers of boards of pharmacy, the requirements for license, our schools of pharmacy, and, finally, the presentation of certain general principles which seem to require discussion and action."

This address was presented to what was probably the largest, most attentive and most directly interested audience ever present at the meeting of this, or any other, Section of the American Pharmaceutical Association.

The report of the secretary, Mr. Jos. W. England, contained a resumé of the replies received from seventy schools of pharmacy. Much of this information had been arranged in tabulated form, and will, undoubtedly, be found to be of great value when published in a form to be carefully studied.

The discussion of the propositions contained in the printed programme was then proceeded with. The first of these is: "All laws and regulations governing the licensing of pharmacists should make due distinction between apprentices, clerks and principals, and should establish definite minimum qualifications and indicate the rights and duties of each of these three classes of pharmaceutical workers."

This proposition was, on motion, approved. The second proposition elicited considerable discussion. It read as follows:

"The age of seventeen years and a preliminary general education of one year's satisfactorily completed high-school work, or its educational equivalent, should be the minimum prerequisites to the practical pharmaceutical experience or apprenticeship demanded by the laws, and no drug-store experience acquired at an earlier age or before the attainment of the preliminary education prescribed should be accepted as sufficiently effective to satisfy the intent of the law."

In connection with this proposition Dr. O. A. Wall, of St. Louis, read a paper in which he asserted that the compulsory requirement of preliminary education was un-American and unfair to a large number of the young men of our country, he deplored the drifting of colleges of pharmacy from the teaching of commercial branches of pharmacy into an ultra scientific field.

Dr. Taylor, of New York, called attention to what he considered to be inaccuracies in the paper presented by Dr. Wall and expressed the opinion that the requirements contained in the original proposition were reasonable and readily attainable.

The proposition was further discussed at some length without reaching a definite conclusion when adjournment was called for.

SECOND SESSION, Tuesday, September 4, 1906.—The section was called to order on Wednesday morning when the chairman announced that the committee directly in charge of the programme of this section had recast several of the propositions and desired to present them in this revised form.

This being agreed to the secretary was requested to read the propositions, as follows:

(1) No person shall be licensed to practice as an assistant pharmacist who has not attained the age of twenty-one years.

(2) The pharmaceutical training and experience required for the licensing of assistant pharmacists should together occupy not less than four years, all of which may consist of drug store practice, or may consist of three years' drug store practice and one academic year's work in a pharmaceutical school, or of two years' drug store practice and two academic years' work in a school of pharmacy.

(3) No person should be licensed as a registered pharmacist and given the right to conduct a pharmacy who has not served at least two years as an assistant pharmacist.

(4) The pharmaceutical college training and drug store experience required for the licensing of registered pharmacists should together occupy not less than five years, of which not less than three years should be drug store experience, and graduation from an approved school of pharmacy should be required of all candidates for license as registered pharmacists.

(5) All candidates for license to practice pharmacy should be required to pass such examinations as may in the opinion of the Board of Pharmacy be deemed necessary. Due credit should be

given for successfully completed courses in approved pharmaceutical schools, but all candidates should be examined upon their ability to correctly read and dispense prescriptions.

(6) A preliminary general education of not less than one year's satisfactorily completed high-school work, or its educational equivalent, should be required as a prerequisite to the pharmaceutical experience or apprenticeship required for license and for admission to pharmaceutical schools.

These suggestions were vigorously discussed for upwards of three hours, but were severally adopted, as proposed by the chairman, and referred, as the suggestions of the Section on Education and Legislation of the American Pharmaceutical Association, to the conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy.

Papers Presented to the Section.

The reading of miscellaneous papers that had been presented to the section was then proceeded with. The first to be read was:—

The A. Ph. A. the Post-graduate Course for the Retail Pharmacist.

By C. S. N. Hallberg.

The author of this paper dwelt at some length on the advantages of taking an active interest in association work and also suggested how members of the association could enlarge on their present field of usefulness.

Store Experience.

By Clement B. Lowe.

The author of this paper believes it to be a mistake not to require store experience for graduation in pharmacy. He believes that there are many stores that can and do give young men excellent practical experience.

Something to Think About.

By W. F. Kammerer.

The paper includes a discussion of present-day conditions, as they appear to the author, and constitutes a strong plea for shorter hours and better opportunities for those engaged in the retail drug store.

The following papers were read by titles:

THE LEGAL RECOGNITION OF THE U. S. P.
By Joseph W. England.

A. PH. A. NARCOTIC LAW MODEL.
By James H. BEAL.

WHAT ATTITUDE SHOULD THE DRUG TRADE ASSUME TOWARD PATENT MEDICINE LEGISLATION?
By Harry B. Mason.

A SYMPOSIUM OF THE PRINCIPAL PROVISIONS OF THE FEDERAL PURE FOOD AND DRUG LAW.
By James H. Beal.

CORRESPONDENCE COURSES IN PHARMACY.
By James H. Beal.

The officers for the coming year are: Oscar Oldberg, chairman; and Joseph W. England, secretary.

JOINT CONFERENCE OF BOARDS AND FACULTIES OF PHARMACY.

The joint meeting of the members of the National Association of Boards of Pharmacy and of the members of the Conference of Pharmaceutical Faculties was held on the afternoon of Wednesday, September 5, 1906.

Mr. Irvin A. Keith, of South Dakota, was elected to preside, and Prof. Clement B. Lowe, of Pennsylvania, was selected as secretary.

After some discussion all of the recommendations adopted by the Section on Education and Legislation were endorsed.

The fourth recommendation was slightly amended, by adding: "Provided, however, that when any licensed assistant pharmacist attends upon the courses of instruction at a school of pharmacy subsequent to the date of his license as such, the time occupied by such school attendance may be deducted from that two-year service."

The conference then proceeded to the consideration of additional recommendations contained in the preliminary programme issued by the Joint Committee. The following recommendations were approved:—

(7) In the determination of the fitness of any applicant to receive a license to practice pharmacy, all important facts of his educational history, practical experience and technical services should be taken into account, including his preliminary general education, his special education in pharmaceutical and other related technical schools, his practical experience in pharmacy and the

results of the examinations he has passed, and an average of these several factors, each assigned its appropriate value, should be adopted as the passing grade.

(8) Definite and uniform conditions of efficiency should be adopted which all pharmaceutical schools must comply with in order to receive recognition by the Boards of Pharmacy in all cases where students and graduates of such schools receive credit in any form for the courses they have completed or for the time of attendance at such schools, these conditions of efficiency to be made public and to be applied equally to all schools.

The conditions of efficiency prescribed for the recognition of schools of pharmacy should relate solely to matters affecting the character of their educational work.

(9) Special education for the practice of pharmacy is in this age a necessity and should as rapidly as possible be made compulsory, and the rules of the Boards of Pharmacy should be such as to promote and encourage it in all practicable ways.

The special pharmaceutical education required should include substantial laboratory courses.

(10) A Syllabus of Pharmacy Examinations should be prepared which shall indicate the subjects to be included in the Board examinations as well as in the courses of instruction in the pharmaceutical schools, with the view to the attainment of a reasonably uniform standard of minimum requirements which may be adopted by all Boards and Schools.

(11) A national Committee on Examination Questions should be appointed by the National Association of Boards of Pharmacy, which committee should consist of members, including experienced specialists in the subjects mentioned in the Syllabus of Pharmacy Examinations, who shall, under the direction of the said Association, prepare questions suitable for the examinations to be held by such State Boards of Pharmacy as may avail themselves of the services of said Committee.

(12) We recommend to all concerned that the foregoing principles and standards be adhered to in any amendments to the pharmacy laws hereafter proposed in order that national uniformity may be ultimately attained. The minimum requirements indicated, and especially the preliminary general education, should be increased from time to time as circumstances permit.

We further strongly urge that the Boards of Pharmacy employ the discretionary powers already theirs under the existing laws to improve the educational status of the pharmacists of the future.

The Joint Conference adjourned subject to a call for reorganization at the next annual meeting of the conference of Teaching Faculties and the National Association of Boards of Pharmacy.

SECTION ON SCIENTIFIC PAPERS.

CHARLES E. CASPARI, Chairman. M. I. WILBERT, Secretary, *pro tem.*

FIRST SESSION.—The first session of this section was held on Thursday, September 6, 1906. The address of the chairman con-

sisted of an interesting and readily followed review of the uses of physical forces, particularly electricity, in chemistry and attention was more particularly directed to the electrolysis of organic compounds. Following the address by the chairman the Committee on Ebert Prize, through its chairman, Prof. W. A. Puckner, announced that the prize had been awarded to J. O. Schlotterbeck for his "Contribution on the Chemistry of Bocconia Cordata."

The report of the committee on Drug Market was presented, in abstract, by Lyman F. Kebler.

The consideration of original contributions was then proceeded with as follows:—

Otto of Rose.

By John Uri Lloyd.

Professor Lloyd presented several authentic samples of otto of rose, and also described how he was able to secure the specimen of otto of white rose and otto of red rose directly from the still.

Chemical Examination of Eriodictyon.

By F. B. Power and Frank Jutim.

This paper was presented in abstract by Prof. Charles Caspari, Jr. It consists of a review of the literature and records of previous examinations and also recounts in detail the results of the present examination.

The Botanical Characters of some California Species of Grindelia.

By P. E. F. Pérrèdes.

This paper was also presented in abstract by Professor Caspari. It contains the account of an extensive investigation of the grindelias of commerce. The most widely used and most frequently met with species, at the present time, is Grindelia Camporum.

Separation of Morphine from Glycerin.

By H. M. Gordin. In collaboration with W. H. Harrison.

From a solution of a morphine salt in glycerin the alkaloid is not precipitated by alkaline carbonates. The glycerin cannot be driven off by steam at temperatures that would not injure the morphine. Removal of glycerin by converting it into a lead compound by means of PbO and subsequent treatment with hot amyl alcohol gave negative results. Owing to the solubility of glycerin in amyl

alcohol direct shaking out with this solvent does not work. Best method is to dilute glycerin solution with water and precipitate morphine as periodide by Wagner's reagent. From the periodide the alkaloid is recovered in the usual way. About 80 per cent. of morphine is recovered by this method. (See p. 464).

Some Alkaloidal Assays.

By H. M. Gordin.

By means of three special apparatus alkaloidal assays can be made more exact. Instead of ammonia fixed alkali or alkaline carbonates can be used to set alkaloids free. By using proper immiscible solvents no alkali contaminates alkaloids except traces of ammonia formed by action of alkali upon the albuminous matter of drug. Concentrations of ethereal solutions of alkaloids can be carried out in a special separating funnel and thus transferring of liquid from vessel to vessel avoided. Exact separation of immiscible solvents is accomplished by using separating funnel with two outlets. (See p. 458).

Gelsemium.

By L. E. Sayre.

A further study of the fresh and dry root with reference to the alkaloidal content in the two conditions. The fresh root was carefully collected and a portion of the same dried. The two were analyzed, or assayed. The present paper is a sequel to the one presented to the Association last year, and touched upon the question of the process of assay of gelsemium.

Commercial Cocoas.

By Wilbur L. Scoville.

A comparison of the analytical data obtained from ten popular brands of cocoa.

The second session of the Section on Scientific Papers was called to order on Friday, September 7th, when the following papers were presented:—

A Method for the Preparation of Solutions of the Active Principle of the Suprarenal Gland.

By Charles E. Vanderkleed.

The author, in this paper, describes a method for preparing a solution of the active principle directly from the suprarenal gland.

The paper also contains a review of the literature and a resumé of the previous work done in connection with the isolation of the active principle of the suprarenal gland.

Determination of Phosphorus in Phosphorated Resin and in other Pharmaceutical Preparations.

By Joseph L. Turner and Charles E. Vanderkleed.

The phosphorus is oxidized with nitric acid; the organic matter is oxidized by the Kjeldahl method and the phosphorus finally determined as magnesium pyrophosphate.

A Simple Method of Testing Pepsin.

By Frank R. Eldred and W. C. Bartholomew.

A comparison of the results obtained in testing several commercial pepsins by the methods of the seventh and eighth revisions of the U.S.P., and by methods based upon the amounts of peptones and albumoses formed in solutions and suspensions of egg-white during definite periods.

Detection of Small Quantities of Copper and Iron in Glycerin.

By S. K. Kahn.

This paper was read by Dr. C. B. Lowe and describes a method for absorbing the salts of copper, present in hot solutions, by means of stearic acid.

Cactus Grandiflorus.

By L. E. Sayre.

A study of the constituents of the drug. Authentic material was obtained, consisting of the stems of the plant. Five pounds of the fresh, finely chopped stems were properly extracted. The resulting tincture was examined and a special study of the physiological action of the preparation was given. The whole work was performed with reference to the question before the Committee of Revision of the Pharmacopœia: Shall Cactus be admitted into our official standard?

A number of tracings presented in connection with this paper were further explained by Dr. Reid Hunt.

Method for the Assay of Ointments Containing Extracts of Belladonna, Stramonium and Henbane.

By Charles E. Vanderkleed.

METHODS FOR THE ANALYSIS OF GRANULAR EFFERVESCENT SALTS.
By Charles E. Vanderkleed and Joseph L. Turner.

ESTIMATION OF ALOIN IN ALOES.
By Frank R. Eldred and C. A. Jennings.

COLOR TEST FOR METHYLENE-BLUE.
By L. N. Sahm and William Mittelbach.

It is shown that the adulteration of methylene-blue may readily be detected by a comparison of color stains on paper by solutions of definite strength.

THE BEHAVIOR OF ALKALOIDAL SALTS TOWARDS IMMISCIBLE SOLVENTS.
By Dr. Edward Schaer.

This paper was presented in abstract by W. A. Puckner and contains a review of some thesis work done in the University of Strassburg.

TINCTURE OF NUX VOMICA, U.S.P. 1900.
By Joseph W. England.

This is a review of the history of the tincture of nux vomica in the several editions of the U.S.P. and a recommendation for the reversion to the original method of making the tincture directly from the drug.

A COMPARISON OF THE SEVENTH AND EIGHTH U.S.P. REQUIREMENTS FOR MORPHINE IN TINCTURE OF OPIUM.
By Theo. D. Wetterstroem.

The lime-water purification of morphine in the U.S.P., VIII, would seem to demand a minimum requirement of 1·15 grammes morphine per 100 c.c. tincture of opium.

PERCENTAGE OF ALCOHOL REMAINING IN FLUID EXTRACTS.
By Joseph Feil.

The following papers were read by title:—

OIL OF SANTAL.
By A. R. L. Dohme.

PRELIMINARY PAPER ON THE USE OF THE COLORING MATTER IN GRAPE SKINS AS AN INDICATOR.
By E. V. Howell.

CEDAR LEAF OIL.
By F. W. Brandel.

ARTEMISIA OIL.
By Edward Kremers.

EUCALYPTUS OIL.
By Edward Kremers.

The special discussion that had been arranged for on "The Assay Methods of the U. S. P." was, on motion, extended to include that portion of the report of the committee on the revision of the United States Pharmacopœia which related more specifically to the assay processes.

This report was read by Dr. Lyons and the subsequent discussion was participated in by a number of the members present.

A motion was offered suggesting that the American Pharmaceutical Association request that the Committee on Revision issue a supplement to the Pharmacopœia of the United States VIII, containing such changes in assay processes as are deemed important.

This motion was subsequently amended and the Secretary of the Section was instructed to transmit to the Chairman of the Committee on Revision, a synopsis of the suggestions for corrections and changes that may be offered by members of the section.

After some additional, rather informal, discussion on the official assay processes for essential oil, the section adjourned.

The officers for the ensuing year are: Chairman, Reid Hunt; and Secretary, Virgil Coblentz.

SECTION ON PRACTICAL PHARMACY AND DISPENSING.

WM. C. ALPERS, Chairman. H. A. B. DUNNING, Secretary.

The first meeting of the Section on Practical Pharmacy and Dispensing was held on the evening of Thursday, September 6, 1906, at 8 o'clock.

The address by the chairman consisted of a study of conditions in foreign countries, based on communications received from United States Consular agents, through the Secretary of State, Mr. Elihu Root.

The replies emanated from all parts of the world and are a fair indication of the practices, advantages as well as the disadvantages of pharmacists in the several countries from which replies were received.

Among the papers presented at the initial meeting we mention:

SYDENHAM'S LAUDANUM.

By M. I. Wilbert.

This paper consisted of a review of the history of Sydenham's Laudanum and constitutes a plea for the introduction of the "Tinctura opii crocata," a formula for which was included in the final protocol of the International Conference for the unification of the formulas of potent medicaments.

LABORATORY NOTES.

By H. A. B. Dunning.

This paper contains a large number of practical suggestions on a variety of official preparations and pharmaceutical processes.

SECOND SESSION.—Friday, September 7, 1906.

A SQUARE DEAL PRESCRIPTION BLANK.

By F. M. Apple.

The writer of this paper makes a strong plea for the introduction and use of a prescription blank which places the responsibility for the refusal to renew prescriptions clearly on the physician.

THE FATTY FACTORS OF UNGUENTS.

By Frank E. Fisk.

In this paper the author calls attention to the puzzling problems that confront the pharmacist in connection with fixed oils and analogous problems. He further discusses the sources of the difficulty, its prevention and its cure.

CIRCULATORY DISPLACEMENT IN MAKING PHARMACEUTICAL PREPARATIONS.

By William C. Alpers.

In connection with this paper the author gave a demonstration of how many solutions could be made, advantageously, by means of circulatory displacement.

CRITICISM OF PRESCRIPTIONS COLLECTED FROM EVERYWHERE.

By H. A. B. Dunning.

This contribution consisted of a rather general discussion and criticism of a very large number of prescriptions or formulæ.

Acetone Collodions.
By George M. Beringer.

This paper, owing to lack of time, was read by title. (See p. 470).

The officers of the Section for the ensuing year are: H. A. B. Dunning, Chairman; Joseph Weinstein, Secretary; F. M. Apple, Associate.

SECTION ON COMMERCIAL INTERESTS.

H. P. Hynson, Chairman. H. D. Knisely, Secretary.

The first session of the Section on Commercial Interests was called to order by the chairman, Mr. H. P. Hynson, on the evening of September 4, 1906.

After extending the usual greeting to the members present, the chairman called on the delegates from the several State pharmaceutical associations to outline the several methods, proposed or adopted, for improving the commercial condition of the retail drug trade in their own State.

In connection with these reports the possible effect of the introduction of parcel post was discussed at some length. Among other subjects of immediate interest, the direct responsibility of retail druggists for vending adulterated or impure drugs and chemicals was also given more than usual consideration.

The discussion on co-operative buying was one of unusual interest in that it evidenced how widely varied are the opinions that can be formed on any one subject. Among the contributions on this subject, the following papers represent probably the extremes.

Advantages of Co-operative Buying.
By W. C. Anderson.

The author believes that co-operative buying clubs of from 10 to 300 members are born of necessity rather than choice. He also believes that the objects that are sought are worthy and are of benefit to all, even the smallest dealer, chief among these advantages is the possibility of securing fresh stock in small quantities, at a minimum price.

Results of Co-operative Buying.
By M. N. Kline.

This paper was read by Mr. Joseph W. England. The author believes it to be unprofitable and impracticable for associations of

retail druggists to engage in co operative buying. He believes that co-operative manufacturing is even more hopeless.

OBJECTIONS TO CO-OPERATIVE BUYING.
By William Mittelbach.

Disadvantages greater than advantages. Co-operative buying eliminates competition. Under present conditions jobber is necessary to quickly distribute goods, particularly in sparsely settled territory.

The general discussion on co-operative buying was participated in by Messrs. Sherman, Apple, Alpers and others.

WOMEN AS DISPENSERS AND UNPHARMACEUTICALLY TRAINED SALESWOMEN.
By Charlotte E. Stinson.

Prejudice, still existing in some quarters, against women at the prescription counter and in the drug store, is held only by those who have never employed, or worked with women in these capacities.

THE SECOND SESSION of the Commercial Section was held on the afternoon of September 7, 1906. The first paper of the afternoon :

PROFITS AND LOSSES : ELEVEN DRUGGISTS AND THEIR INCOMES.
By Harry B. Mason.

A collection of statements indicating the gross profits and net earnings of druggists in different sections of the country. Suggestive facts. A plea for more complete records. Inaccurate records are better than none.

A SYMPOSIUM ON STOCK: Identification and Preservation, was taken part in by H. H. Rusby, who spoke of crude drugs, and Charles Caspari, Jr., who spoke at some length on galenicals.

This was followed by an interesting and, at times, animated discussion.

The following papers were accepted by title :—

CLERKS AND ASSISTANTS; THEIR PROFITABLE EMPLOYMENT.
By Andrew J. Eckstein.

BUYING; HOW, WHEN AND WHAT TO BUY.
By Stanley B. Simpson.

THE PHARMACIST'S BIRTH-RIGHT.
By Louis Schulze.

COMMERCIAL POSSIBILITIES OF LOCAL BRANCHES.
By M. I. Wilbert.

MACHINE-MADE VS. HAND MADE SOLUBLE ELASTIC CAPSULES.
By A. M. Hance.

COMMERCIAL ETHICS; TRUE SUCCESS IN PHARMACY.
By George C. Bartells.

The officers for the ensuing year are: Chairman, H. D. Knisely; Secretary, Charles H. Avery; Associates, W. C. Powell, Charlotte E. Stinson, J. R. Francis.

SECTION ON HISTORICAL PHARMACY.

JOHN F. HANCOCK, Chairman. C. S. N. HALLBERG, Secretary.
EDW. KREMERS, Historian.

The first session of this section was called to order on the morning of September 7, 1906, by John F. Hancock, the chairman.

The address of the chairman contained several suggestions for the future conduct of the section that were referred to the officers for the ensuing year.

The annual report of the historian contained a detailed account of what had been accomplished during the past year and recommended that the exhibition in connection with the meetings of the American Medical Association, which had been inaugurated in connection with the meeting of the American Medical Association in Boston, during the past Summer, be continued.

ORIGINAL PAPERS.

Among the contributions presented were:—

AN EARLY FORERUNNER OF THE NATIONAL FORMULARY.
By M. I. Wilbert.

A COLLECTION OF INTERESTING HISTORICAL MATERIAL, INCLUDING A PRESCRIPTION BOOK USED IN RALEIGH, N. C., DURING THE CIVIL WAR.
By E. V. Howell.

The prescription book constitutes an interesting reminder of conditions and practices during the Civil War. The prevailing prices for prescriptions being from two to ten dollars, the latter being the price asked for 12 pills containing 24 grains of quinine sulphate.

HISTORICAL SKETCH OF THE NEW JERSEY PHARMACEUTICAL ASSOCIATION.

By Edward A. Sayer.

REMINISCENCES.

By Ewan McIntyre.

This communication constituted an interesting series of personal reminiscenses from 1842, when the writer entered a retail drug store in the city of New York, and included a rather detailed account of the occurrences which led up to the organization of the American Pharmaceutical Association.

LETTERS FROM EARLY PHARMACISTS, NOW DEAD, ALSO OTHER MATERIAL.

Presented by John F. Hancock.

CONTRIBUTIONS TO A PHARMACOGRAPHIA AMERICANA.

By Edw. Kremers.

The SECOND SESSION of the Section on Historical Pharmacy was held on the evening of September 7, 1906, as a Sloan-Procter memorial meeting.

The Secretary read several letters from former employees and friends of Mr. Sloan.

The Chairman then introduced Mr. A. E. Ebert, an old friend and associate of Mr. George W. Sloan, who presented an essay entitled :—

GEORGE W. SLOAN AS A PHARMACIST.

This was followed by a paper by J. F. Hurty eulogizing "George W. Sloan as a citizen."

The memory of William Procter, Jr., was reviewed by Prof. Jos. P. Remington, who read an interesting paper recounting personal reminiscenses.

The Secretary of the Section read several letters that had been contributed by older members of the Association; among others, G. P. Sharp and William Saunders.

The officers for the ensuing year are Ewan McIntyre, Chairman, and E. G. Eberle, Secretary.

CONTINUED SECOND SESSION OF THE ASSOCIATION.

The continued second session was called to order on Saturday morning, September 8, 1906, at 9 o'clock.

The business transacted was mainly of a routine nature and consisted largely of reports of committees.

The report of the Committee on National Formulary was received and the Secretary of the Association was instructed to secure for it widespread publicity.

The committee on time and place of meeting recommended that the next annual meeting be held in the city of New York.

THIRD GENERAL SESSION OF THE ASSOCIATION.

The third general session of the Association was called to order immediately after the adjournment of the continued second session on Saturday morning, September 8, 1906.

From the minutes of the council it was learned that 311 new members had joined the Association since the meeting in Atlantic City, N. J., in 1905, and that the total active membership was 1,989.

The Committee on Resolutions, through its chairman, Professor Hallberg, presented a number of resolutions that were endorsed by the Association.

From the Section on Commercial Interests the committee offered a resolution against the introduction of parcel post.

Another resolution from the same section commended the work of women pharmacists.

The committee on its own behalf introduced a resolution endorsing the work of the Council of Pharmacy and Chemistry of the American Medical Association.

A second resolution provided for the appointment of a committee to inquire into the feasibility of reorganizing the machinery of the American Pharmaceutical Association.

A third resolution expressed the wish that the recently enacted pure food and drug law be properly enforced.

The final resolution extended the sympathies of the Association to the members of the profession in San Francisco and adjoining territory in their loss sustained during the recent catastrophe.

After the introduction of the officers for the ensuing year, and the usual vote of thanks to the retiring officers and others who had contributed to the success of the present meeting, the Fifty-fourth Annual Session of the American Pharmaceutical Association was declared adjourned.

NEW AND NON-OFFICIAL REMEDIES.

Pharmacists generally should be more than ordinarily interested in the preliminary publication of material for the proposed book on "New and Non-official Remedies" which has been compiled by the Council on Pharmacy and Chemistry of the American Medical Association.

The first instalment of this material appears in the *Journal of the American Medical Association* for September 15, 1906, and includes 23 titles. It is announced that successive instalments will be published weekly until all of the available material has been printed.

The primary object of this preliminary publication is to secure from physicians, pharmacists and others who may be interested, comments and criticisms for the purpose of avoiding errors and correcting mistakes.

It is intended that the book itself should appear as an annual and serve as a reference book, for physicians, on the available newer remedies that are, or appear to be, all that is claimed for them and therefore worthy of support.

As pharmacists must necessarily be well informed on the methods of exploiting and of marketing these several preparations, and should also be thoroughly familiar with the physical as well as the chemical properties of the different articles, they can, by honest criticism of the descriptive articles now being published, contribute materially toward making the proposed book as free from serious errors or mistakes as is possible with a publication of this kind.

The following explanatory note, by the secretary of the council, and the rules that have been adopted to govern the recognition of the several articles are printed as an introductory to the initial instalment of the descriptive articles, and will serve as an additional impetus and a guide for pharmacists who are willing or able to contribute in any way towards the perfection of the work in hand.

Here follow the introduction and the rules published on page 856 of the *Journal of the American Medical Association* for September 15, 1906:—

The following articles have been tentatively accepted by the Council on Pharmacy and Chemistry of the American Medical Association for inclusion in the proposed annual, "New and Non-official Remedies." Their acceptance has been based largely on evidence supplied by the manufacturer or his agent, but to some extent on investigation made by or under the direction of the

Council. Criticisms and corrections are asked for to aid in the revision of the matter before final acceptance and publication in book form.

The Council desires physicians to understand that the acceptance of an article does not necessarily mean a recommendation, but that so far as known it complies with the rules adopted by the Council.

W. A. PUCKNER, *Secretary.*

RULES GOVERNING THE ADMISSION OF ARTICLES TO THE BOOK "NEW AND NON-OFFICIAL REMEDIES."

(The term "article" shall mean any drug, chemical or similar preparation used in the treatment of disease.)

RULE 1.—No article shall be admitted unless its active medicinal ingredients and the amounts of such ingredients in a given quantity of the article be furnished for publication. The general composition of the vehicle, its alcoholic percentage, if any, and the identity of other preservatives, if present, must be furnished.

RULE 2.—No chemical compound will be admitted unless sufficient information be furnished regarding tests for identity, purity, and strength, the rational formula or the structural formula, if known.

RULE 3.—No article that is advertised to the public will be admitted; but this rule wiil not apply to disinfectants, and food preparations, except when advertised in an objectionable manner.

RULE 4.—No article will be admitted whose label, package or circular accompanying the package contains the names of diseases, in the treatment of which the article is indicated. The therapeutic indications, properties and doses may be stated. (This rule does not apply to literature distributed solely to physicians, to advertising in medical journals, or to vaccines and antitoxins.)

RULE 5.—No article will be admitted or retained concerning which the manufacturer, or his agents, make false or misleading statements as to geographical source, raw material from which made, or method of collection or preparation.

RULE 6.—No article will be admitted or retained concerning which the manufacturer or his agents make unwarranted, exaggerated or misleading statements as to the therapeutic value.

RULE 7.—Labels on articles containing "poisonous" or "potent" substances must show the amounts of each of such ingredients in a given quantity of the product. A list of such substances will be prepared.

RULE 8.—If the trade name of an article is not sufficiently descriptive of its chemical composition or pharmaceutical character, or is, for any other reason, objectionable, the Council reserves the right to include with the trade name a descriptive title in the book. Articles bearing objectionably suggestive names will be refused consideration.

RULE 9.—If the name of an article is registered, or the label copyrighted, the date of registration and a copy of the protected label should be furnished the Council. In case of registration in foreign countries, the name under which the article is registered should be supplied.

RULE 10.—If the article is patented—either process or product—the number and date of such patent or patents should be furnished.

PHILADELPHIA BRANCH AMERICAN PHARMACEUTICAL ASSOCIATION.

SHORTER HOURS AND A DAY FOR REST.

Of the numerous problems that confront the retail pharmacist of to-day probably few are of more immediate importance, and certainly none are more far-reaching in their ultimate possibilities, than the question of curtailing the inordinately long hours of confinement and of introducing at least a partial day of rest and recreation into the more or less monotonous existence of at least many of the retail pharmacists of the present time.

In the larger cities and towns of this country but few places of business, apart from tobacconists' shops and saloons, make any attempt to cater to the needs and the wants of the public during anywhere near the number of hours that retail drug stores are widely open and brightly illuminated.

It has long been acknowledged that the fruit of uninterrupted labor is to be found in physical as well as moral debasement, and this fact appears to be well illustrated in the practices of certain so-called pharmacists or druggists. It will not be necessary to point out in this connection, that the practices that are followed by at least some of these so-called pharmacists are not above reproach, and that, in some sections of the country at least, pharmacy is used as a cloak for the promiscuous sale of liquors, habit-forming drugs, fraudulent or even dangerous nostrums, abortifacients and a variety of other more or less objectionable articles and appliances.

It is practices of this kind that have brought pharmacy into disrepute in some quarters and have caused the shadow of suspicion to rest on all, even the most reputable followers of our craft. It will hardly be necessary to add that so long as we ourselves are not willing to assist in exposing the men who are guilty of practices of this kind, and so long as we are not willing, or not able to point out to our neighbors how they can differentiate between the honest, upright pharmacist and the ignorant, or arrant knave who stoops to use pharmacy as a cloak for unlawful practices, just so long must we, collectively, suffer under the frequently expressed suspicion of being ourselves guilty of practices of this kind.

It has repeatedly been suggested that few factors have contributed more largely to develop the present-day spirit of apathy and general disinterestedness, so frequently evidenced by the present-day retail

pharmacist, than the narrowing influences of long hours, close confinement and the accompanying isolation that pharmacists themselves have submitted to for generations past.

It is well known that rest and recreation afford healthful relaxation to persons in every walk of life, and it is also known that some degree of relaxation from the ordinary routine of every-day existence is absolutely essential to continued activity or possible progress, in any of the numerous vocations now followed by civilized man.

This being recognized as a fact, the moral injustice of the inordinately long hours submitted to by the retail pharmacist, and his assistants, presents itself to us in quite a different light, and, because of the importance of the practice of pharmacy to the health as well as the welfare of the community, becomes in reality a matter of public concern.

To more fully discuss the several questions that are more or less directly involved, it is proposed to hold a joint meeting under the auspices of the members of the Philadelphia College of Pharmacy and the members of the Philadelphia Branch of the American Pharmaceutical Association, on the evening of Tuesday, October 16, 1906, in the Museum of the Philadelphia College of Pharmacy, to consider:—

Rest and recreation as a physical necessity.

Relaxation as a factor in morality.

Sunday rest as a religious institution.

Legal aspects of Sunday closing.

Practical experiences with Sunday closing.

M. I. WILBERT, Secretary,
Philadelphia Branch Am. Ph. A.

PROPOSED PROGRAM FOR THE MEETINGS OF THE PHILADELPHIA BRANCH OF THE A. PH. A., 1906–1907.

October.—Shorter Hours and a Day of Rest.

November.—The Work of the Council on Pharmacy and Chemistry of the American Medical Association.

December.—The Federal Pure Food and Drug Law.

January.—The Debasing Influences of Popular Nostrums.

February.—Higher Educational Requirements for Pharmacists.

March.—Indiscriminate Renewal of Prescriptions.

April.—Popularization of U.S.P. and N.F. Preparations.

May.—Proposed Reorganization of the American Pharmaceutical Association.

EDWARD TONKIN DOBBINS,
1841-1906 (see page 550).

THE AMERICAN
JOURNAL OF PHARMACY

NOVEMBER, 1906.

SUNDAY CLOSING AND SHORTER HOURS.

By R. W. Cuthbert.

There is nothing that touches my sympathies more than the pleading of my brother druggist for the days of rest that are enjoyed by every other man. I know that there are some seemingly good reasons why drug stores should be open on Sundays, but I cannot see why we are required to be open on Sunday more than all night. I have been in the drug business since 1862 and in that time have worked more than a thousand Sundays. My long experience at a prescription counter convinces me that the burden is unnecessary and that some thing should be done to bring about a change.

The subject has been discussed from apparently every standpoint, yet we have seemingly made no advance. These discussions have been almost entirely among ourselves, and through our drug papers which are seldom read by the general public. We should prepare the public for what is evidently coming and have them take part in these discussions and get their expression. This we can do by discussing the subject more openly and getting at the people through our daily papers. Perhaps the public is more reasonable than we have given them credit for. If I understand the matter properly, the druggist is hesitating solely on the ground that his patrons would oppose him in his undertaking.

Until a few years ago department stores, grocers, butchers, etc., were open late at night, now all that has changed and the public seems very well satisfied and apparently for the good of others, rather prefers it to be so. There is a common impression that it is absolutely necessary for drug stores to be open on Sundays, but if the change were brought about it would be but a short time before the people would adjust themselves to the new conditions.

Until about five years ago I kept my store open all day, but kept my windows curtained, my show cases covered and endeavored to sell only medicines and articles used in the sick-room. In this way I reduced my Sunday business to a point where it was not difficult to close most of the day. The last five years I have opened on Sunday only from 9 A.M. to 1 P.M.—four hours. I did this without issuing any notice, but merely hung a sign on my store door on Sundays. I found very little objection among my patrons and a great many expressed their approval. I find almost all of the work we do during these four hours is among one or two dozen families, whom we term our Sunday regulars. Before the adoption of this plan my business had been for several years on a standstill, but has since constantly increased. What we lose by closing is more than made up in other ways.

Saturday's renewals have increased and I see a disposition among my customers to gather up everything they think they may need for Sunday, and many orders are even held over till Monday. This shows that people can and are willing to adjust themselves to conditions that are reasonable. Now that I have done this in the past it would be easy to shorten my hours still further, and I am sure that if a few of my neighboring druggists would follow, that the question would be solved. I would suggest that we get an expression from every retail druggist in this city on the subject and see what the general feeling is. I cannot see why one should work seven days a week if there is any way out of it.

Let us do this thing among ourselves and without legislation. Let us get together and set a time, and let the people know that at a certain time we will close our stores all day on Sundays and that it will be necessary for them to prepare themselves for it. Don't wait for legislation, don't wait till every man is converted to our way of thinking but let a few dozen, if not more, take the lead believing that others will follow. If we should call a meeting of all the men in the business to formulate a plan to bring about Sunday closing, I for one would be willing to follow a plan adopted by the majority. If the time is not ripe for all stores to be closed all day on Sundays we might by system have it arranged for one store in a half a dozen or more to be open all day, and each one in that section to take his turn, and let every man that is closed indicate by a card in his window that Mr. —— is open for the filling of all prescriptions.

And now while we are studying the Sunday closing question let us do what we can to shorten our evening hours. I would suggest that we make nine o'clock the closing hour at present, and if that proves successful make it eight later on. Our long hours and Sunday work are certainly a great obstacle in the way of elevating our profession. Men are not fitting themselves with a good education to work every hour of their time outside of the time required for sleep. If this better condition were brought about we would probably find it necessary to make a rule and let the people know that all work done during the night hours would be charged for at an advanced rate and that no work would be done in answer to a bell call on Sunday by the men who were closed.

THE MENTAL NECESSITY OF AN EARLY CLOSING MOVEMENT.

By Joseph W. England, Ph.G.

Some time ago, while in conversation with the famous brain surgeon, Dr. W. W. Keen, we were talking upon the subject of the most valuable things in life, and he made this statement: "*Time* is the most valuable asset of a man's life;" and there is a whole world of truth in this epigrammatic sentence. Time *is* the most valuable asset of a man's life, and there is no asset which is more ruthlessly squandered.

The truest success in life is the highest development of the individual, within, of course, his limitations. But who can tell what his limitations are? A plant grows by what it feeds upon, and the growth of the human body resembles the growth of a plant. So there is a time for mental training, and a time for moral training, and a time for physical training. It is not enough to say that all three of these qualities are brought into play in the exercise of our daily work as retail pharmacists, because this is only true to a limited extent.

It is the habit of some physicians to complain that day and night they are at the beck and call of their patients to a degree that leaves them no time of their own, and robs life of many of its dearest privileges. But if the physicians are the servants of the public, how much more so are the pharmacists who toil in their "prisons of

brick and glass" every day, sixteen hours a day, without, many of them, God's sunshine and fresh air, in a daily grind with small details that wear out their lives before their time? The physician has his changes of air and scene, his variance in the duties of his profession, and, in many cases, *some* leisure hours that he can spend in relaxation and self-culture. But the pharmacist, as a rule, has the same dull, deadly routine to follow, day by day, month by month, and year by year, with little or no variance, and small chance, in many cases, for personal pleasure or personal development.

Why is this? Simply and solely because the pharmacist himself has so willed it. He has educated the public to expect it; and now that the public expects it, he fears to adopt "shorter hours," because all pharmacists will not adopt them also; and other pharmacists may thrive at his expense. Drug stores are so numerous and competition is so keen, in these strenuous days, that he feels he dare not take the risk, even though it would mean, to him, years of added life. But surely, if the small retail grocery stores of Philadelphia can, by common agreement, be closed almost every evening by 6 o'clock, why cannot the drug stores be closed at reasonable hours?

Believe me, there is no *real* necessity for such long hours in the drug business. It is a common thing for many to plead that retail drug stores should be kept open for 16 hours a day because the needs of the sick demand it. As a matter of fact, the needs of the sick require nothing of the sort. The business done after 9 P.M., for example, could just as well be done before that hour, if the public were uneducated, or rather, if the public were educated to see that the 16-hour-a-day service is fraught with serious possibilities of danger to itself by reason of the strain of the life-and-death work required. Human nature has its limitations, and the nature of pharmacists is human nature. The public condemns, and rightly, the railroad company that compels the engineers of its passenger coaches to work 16 hours a day, and if the public but knew of the long and weary watches of the day and night that the average retail pharmacist has to stand guard between the life and death of their loved ones, and the dangers to them, both of omission and commission, that result from the prolonged mental and physical strain, they would not ask for a reform; they would *demand* it. They

would require that every pharmacist would keep "better hours," willy nilly, and enforce that demand by appropriate legislation, if necessary.

But I have wandered from my text. I want to make a plea for "shorter hours" for the retail pharmacist from another view-point, and that is its vital necessity for the mental good of the pharmacist himself, and the profession or work for which he stands as an exponent.

It is unfortunate, in many ways, that our daily work is not wholly a trade or wholly a profession. It is both, and the professional or scientific side suffers through the combination. But it is a condition that exists, and will exist during our lives, at least, so that we will have to make the best of it.

How may the conditions of our daily work be bettered? Most probably, to the largest degree, at least, by personal development along scientific lines. We understand well the basic principles of our science and art, and we are particularly well informed, as a rule, regarding the art, or the practical operations of our calling. But we are "rusty" on the purely scientific side of our work. We have not delved deeply enough into the literature of American pharmacy. We lack sufficiently detailed information regarding the physical and chemical properties, and possibilities, of our drugs, and we lack the spirit or desire for original research work.

It is no idle boast to say that there has been more scientific work done in purely technical pharmacy in this country, during the past fifty years, than perhaps in any other nation of the world. When we think of the wonderful researches of Procter, Parrish, Maisch, Squibb, Trimble and others who have worked so zealously for the development of the sciences relating to pharmacy; when we think of the work our old Philadelphia College of Pharmacy has done during the past eighty-five years in training men for scientific work; when we think of the splendid facilities our college offers for original research-work within her walls—of her fine laboratories, of her eminent teachers, of her wonderful library of 12,000 volumes with its mines of undeveloped scientific possibilities—it should be an inspiration to every one of us to develop the best that is within us and give it to the world.

But all this is idle dreaming—"Castles in Spain"—if there be no time for thought and action, or if the body be worn out by long

hours of dull and deadly routine, so that it cannot think and cannot act. There can be no progress without research, and there can be no research without time. To do work that is "worth the while" requires the proper development of the individual, physically, mentally and morally, and this takes time.

Now, how can this be brought about? The answer is easy. Simply by opening the store later in the morning and closing it earlier in the evening, and closing it every Sunday afternoon. The way to close is to close, or as Horace Greeley would say: "The way to resume specie payments is to resume." Do you realize that by opening your store at 7.30 A.M. and closing it at 8.30 P.M., you would be saving three golden working hours every day, and that this would mean over 1,000 *working* hours a year, or nearly eighty *working days* of thirteen hours each?

What possibilities could be accomplished with such time at your disposal? Not only along scientific lines, but also along the lines of broad general culture, of physical well-being, of moral duties, and the proper performance of family obligations.

The realization of such possibilities would change the entire aspect of our daily life, would make it infinitely more attractive, and would bring in its train a development that would be of untold value for our own well-being and for the public good; and it is not impossible of achievement. The reasoning, thinking public is not unreasonable. Its members simply need to be educated upon the real necessity of an "early-closing" movement—its benefit to themselves in better service—and the rest will be easy; and with public opinion behind you in such a movement, legislation would be altogether unnecessary.

SUNDAY REST AS A RELIGIOUS INSTITUTION.

By David M. Steele.

I do not know why I have been chosen to make this one of this series of addresses to-night unless it be because of a chance remark I think I dropped in the hearing of some of you when you did me the honor last year to ask me to preach the Baccalaureate Sermon to the graduating class of the Philadelphia College of Pharmacy. I remember saying at that time that I thought, as a clergyman, I could sympathize with certain of you, as druggists, in that you had

to work so much of your time; that there was certainly no other profession in which so many men had to work so many hours of so many days in the week as they do in yours—except my own. The one thing that we have in common is that, as everyone knows, we both have to work Sundays. If there be any question which of us works the longer hours on week days, it finds answer in the fact that, while you at this moment are sitting here resting I, even at this late hour of the night, am still working—making this speech. The only thing that might still leave open the question which of us works the harder would be the possibility that I who make this speech am having an easier time than you who have to listen to it. But that question I hurry by, being afraid to put it to vote, and come to my theme itself.

About this matter of keeping Sunday, there are two things to be said at the outset. The first is that it is one of the things one does, if at all, not because he has to, but because he wants to. The second is, that Sunday as an institution is not something that exists for its own sake and to be honored as such, but something that exists to serve a purpose and is to be used as such. It is not the chief end of man to keep Sunday; it is the chief end of Sunday to serve man. If these two facts be gotten clearly in mind, much of the difficulty which hedges the subject about resolves itself, much of the discussion current regarding it is robbed of its bitterness and much of the perplexity and apprehension of so many people in regard to it is seen to be needless and groundless. May I ask you to consider these two points then for a moment each and, if it is not too confusing, to consider them in their inverse order.

Sunday, I say, is something that exists not for its own sake but for a purpose. All such statements as this come down finally to that classic statement made so long ago that "The Sabbath was made for man and not man for the Sabbath." That single statement sums up and clears up one entire half of the subject and has more meaning than any save the very, very few have ever realized. Man has been called many things, many different kinds of an animal; a social animal, a political animal, a religious animal, etc., and rightly; but he has never been called, and is never called upon to be, a Sabbath-keeping animal merely as such or merely for the Sabbath's sake. Here then stands an institution and here is man. He is of no use to it; it is of use to him. But like everything else it is

of use to him only if he uses it. Here it is: let him take it or leave it, use it or neglect it, esteem it highly or despise it. It will do him no harm if he never touches it; but it will do him no good if he does not touch it.

Furthermore, if he uses it at all, he will use it rightly, never from compulsion but only from choice. Not to see this is the mistake of so many members of the typical, average Sabbath Reform Associations. They make the mistake that every one makes who attempts to make men good by statute. There is, as a matter of fact, no such thing as "breaking the Sabbath" in the sense they speak of. Men cannot break it: they can break themselves against it; but that is a very different matter and a much more important one. If a man does not use the day then he does the day no injury; he injures only himself, and to urge him, with any profit, to use it one need never attempt to coerce or compel but may only persuade and constrain: these are two fundamental, elemental principles. The fact that you—chemists, pharmacists, druggists—are here at this moment and that you are so intent on this discussion is proof that you approve them both. You value Sunday highly and you want to use it. All I have to say is, it is too bad that you can't.

And yet that is not all I have to say; nor is it even an important part of it. Nothing would be more natural, and certainly nothing would be easier, than to stop at this point and to confine myself entirely to railing against those conditions which have robbed you of the day. I could do this all evening; but I am not going to. Neither am I going to do any of several other things that I fancy you expect me to do. There are several aspects of the subject that I am not going to speak of, and that because they are aspects and not the subject itself. It may be well, however, to pause long enough to state these merely in order to set them aside and in doing this to clear the ground for the consideration of the real and only point at issue. Of these there are three. Let me speak them merely in order to say that I am not going to speak about them.

First, I am not going to discuss the subject of church-going. It is an important subject, one worthy of consideration in itself, but it is not this subject. The unfortunate thing is that my subject as you state it—Sunday Rest as a Religious Institution—is practically never discussed apart from this. That is why the discussion so often ends in such confusion. The two subjects are not identical; at best

the second is only a phase or aspect of the first. One point is of importance in this connection, however; that is, that people do use Sunday as a day for going to church about as generally as they use any other holiday for the purpose for which it is appointed. On Sunday perhaps 10 per cent. of the population of this country, who are not compelled to work on that day, go to church. The other 90 per cent. go to Atlantic City or to Coney Island or to the country or to sleep—all of which things are about synonymous so far as using the day for its appointed purpose is concerned. But what of Decoration Day? How many of those who are released by their employers from their work on that day, and for a purpose, regard that purpose seriously? How many take any part in the decoration of dead soldiers' graves and how many spend the day entirely in doing other things? What of the Fourth of July? How many people nowadays ever foregather on that day to hear so much as the Declaration of Independence read? Or of Thanksgiving Day? What percentage of the multitude to whom this becomes a holiday make it in any sense a holy day and show forth in any formal manner any "Thanksgiving to Almighty God for the fruits of the earth and all the other blessings of His merciful Providence?" The percentage in all cases, I trow, is about the same. And the penalty will in all cases be about the same eventually, namely, the denial to people ultimately of these days as holidays for any purpose if they persistently decline to use them for their appointed purposes. But more of this anon.

The second of these three subjects that I desire to set aside as not identical with my own is the so-called "breaking" of the Sabbath by working upon it; the sin involved in working on Sunday. This also is a grave and serious subject, but it is not this subject. Here is a point against which many a reformer hurls arguments that break; they break because they fall in such confusion. For this matter is one that requires very clear thinking and the making of very fine distinctions. Everyone realizes that there are kinds of work that are wrong on Sunday—wrong because unnecessary. But everyone must also realize that there are other forms of work that are inevitable. Now the difficult thing is that, in a state of civilization which develops so rapidly as our own, these forms change and give place to each other so rapidly, and that in a civilization so complex as that of the present day a vast and ever

increasing amount of the first is constantly falling into the second class. The thinking of yesterday in this connection will not do to-day nor will the codes and catalogues of former generations serve the present one. The question in just what individual cases Sunday rest were a crime and in just what individual cases Sunday labor is a sin must be settled piecemeal and for every individual. There can be no single, sweeping, definite, dogmatic statement.

And, yet once more, there is a third thing which I conceive to be a subject apart from the theme you have set me. Besides the so-called "observance" of the day by going to church and the so-called "breaking" of the day by working upon it, there is the so-called "desecration" of the day by playing upon it. This is a subject upon which I may feel as strongly as I will, but at the same time it is one upon which I realize that I had better feel normally. The Puritan, that harsh mentor who scathed the world with his condemnation and robbed it of its cherished delights, did not strike the human average and his system has suffered accordingly. Ruskin once wrote "God forgive me those who trained me, how I hate this day!" This is one extreme form of observance and its result. As a type of the other extreme, witness last Sunday's baseball game in Chicago with its thirty-five thousand spectators. There is somewhere a normal mean between that morbidness which counts a laugh a sin on Sunday and that flippancy which counts a sin something to laugh at any day, but it is hard to find. It is hard to find because individual temperament, the personal equation and the point of view, all have importance, and the time, the place, the circumstances and the motive all must be considered in relation to each action. The solving of this problem is a task all by itself. It is a mighty task, moreover, since he who performs it must frame an entire critique of amusements as such.

Now I am sure that by this time I seem to have been talking around my subject and not upon it, and to have spent so much time making these three negative statements that there is scant space left for the positive one. But that has been precisely my purpose; for, if these points are cleared up and cleared away, the real point may be tersely put and briefly discussed, the real problem phrased in very few words and its solution set forth in fully as few. The process is like the removing of casings or hulls from a nut which, when thus bared, is easily cracked. Or, once again, to change a

simile as suddenly as to mix a metaphor atrociously, the key to the solution is then seen to be ready at hand—and to be in the hands of the clergy. Sunday rest a religious institution? It is that and it is nothing else.

It may be an accident, but it is a happy one, that my place on this programme is in the middle of this series of five speakers. The first two deal, theoretically, with rest as a physical and rest as a mental necessity; the last two, practically, with certain legal aspects of and certain business experiments with Sunday closing. Between these two pairs, the physician and the professor, the lawyer and the proprietor, stands the priest, and says: The religious use of Sunday rest is not one of several uses; it is the only use worth while. Rest on Sunday is rest for a purpose; that purpose is rest in order to pray. It is necessary and it is permissible for men to pause in their labor to speak with their God; but it is not necessary, and they will not much longer be permitted, to take one day out of seven—a very large share—for any lesser purpose. Strange is it indeed that men so honest, so clear-headed and so far-sighted in all other things should so far fail to see this and fail so persistently. Strange is it that they do not see the anomaly in the theory and the penalty in the fact. The first is that a day of rest is asked upon one ground and is accepted on another; the second, the penalty—and it will soon be paid if this continues—will be the loss of the day upon any ground. He were a mean employer indeed who would not allow his employee to stop his work to say his prayers; but he is an equally mean employee who accepts a day of rest for worship and then spends that day at everything under the sun except worship.

Let me restate this principle. So long as the day was used, and wherever it is still used for its distinctive purpose, it has been and is still gladly given; but in other times and places it has not been and will not be. This is a perfectly natural process. Here as elsewhere cause always precedes effect. The cause is simple; the effect is obvious. This has been the history of the day's loss as a day of rest to men who labor wherever it has been lost to men who do labor. The saying of a generation ago that "There is no God west of the Missouri River" preceded and produced, so surely as a cause ever had an effect, the saying of to-day that "There is no Sunday west of the Mississippi River." Here, as in every similar field, the

case has not been a case of robbery; it has been a case of forfeit. Wherever, for any long-continued period, the day has ceased to be used as a day of worship there has come at length to be no day of rest. Let other men in other fields profit by example before they are taught by experience.

Now, if this great, main, central principle is sound the three foregoing minor ones may be studied at leisure and with profit. Having reached this point, but only then, one can turn squarely about and in reverse order retrace the line of this argument, taking up the three aspects or phases of the main problem for what they really are. He will then see them in a new light and in a new importance. Of course men ought to go to church; of course the amount of labor on Sunday should be limited within the very narrowest possible range of works of necessity; of course, among those main three things that fill men's waking hours, amusement, work and worship, amusement is as far below work in the scale as worship is above it. But all these things must be adjusted one by one.

I am sorry if I have seemed to fail of some duty in not applying this principle to the druggist especially as a member of a special class. But I have refrained from doing this on purpose. I cannot apply it for him; he must do this, as everyone must, for himself and in his own peculiar field. I have tried to treat a subject, not a phase; to frame a theorem, not a theory; to do this in entirety and not in part, and to allow this address as a unit to take its place in this symposium as a whole.

THE DEBASING INFLUENCE OF MONOTONY.

By John K. Thum,
Assistant Apothecary at the German Hospital, Philadelphia.

Herbert Spencer says "Monotony, no matter of what kind, is unfavorable to life." If this be accepted as a truism, what could be more unfavorable and more detrimental to the proper development of a pharmacist than the monotony of seven days a week behind a drug-store counter?

Spencer also says that "A periodical cessation of daily business is requisite as a means of mental health." A sound mind in a sound body is a duty that the pharmacist owes not only to himself but also

to his customers, as it is essential to the proper performance of his duty to safeguard the public health.

Aside from these reasons, however, the pharmacist should be a law-abiding citizen and endeavor to live up to the highest ideals of true citizenship. Recognizing this fact it is unfortunate that we can readily prove that the debasing influences that the average pharmacist has been, and is, subjecting himself to would appear to be directly responsible for his ignoring one of the best-known and most thoroughly well-established laws of our State, by selling many things that are not necessary on Sunday. The so-called blue law of this State has done much to give to the people of our city and of our State a generally accepted day for rest, and it is unfortunate indeed that we, as pharmacists, should not be willing to take advantage of the law to improve ourselves morally, physically and probably financially.

At the present time pharmacists, by taking advantage of an old tradition that gives them the privilege of keeping their shops open on Sundays, sell many things that are not directly in the line of medical supplies and thus take an unfair advantage of their competitors in other lines of trade. Practices of this kind tend to lose for us the respect of other trades-people in our neighborhood and not infrequently incur for us the ill-will and enmity of neighbors who should be our friends. There is an old saying that a man must respect himself before he can expect others to respect him. If the average pharmacist enjoyed the respect and esteem of his neighbors he would not be subjected to the many petty annoyances and impositions that are practised on him at the present time.

Shorter hours and Sunday rest would give the rank and file of pharmacy more time to study, and to broaden themselves mentally, and this would give them culture, which is so necessary for the proper development of a professional man.

Shorter hours would also enable pharmacists to realize the sad condition to which the practice of pharmacy has come, not only in our city and State but throughout the whole of this great nation. Such a realization would tend to make all of us do our own thinking and not allow the editors of pharmaceutical journals, controlled by manufacturing interests or patent-medicine houses, to do it for us. What the rank and file of pharmacists of this country need, and need badly, is the ability to do their own thinking. One of the most

important steps in this direction, it seems to me, is this very question of shorter hours.

Shorter hours will allow us to get out of the monotony of our present-day existence, will allow us time to interest ourselves in what is going on about us and will, above all, permit us to enlarge on our general fund of information and to increase our field of usefulness.

When we, as pharmacists, have arrived at this stage, then, and not until then, will pharmacy, true pharmacy, professional pharmacy rise to the high and exalted position that it should occupy in this great country.

PRACTICAL EXPERIENCE WITH SUNDAY CLOSING.

The difficulties in the way of closing drug stores wholly or in part on Sunday seem more imaginary than real—while local conditions and individual preferences must largely control, yet the fact remains that those who have adopted lesser hours on Sunday universally speak in favor of the plan. Their experience is that their business has been little—if any—perceptibly lessened when the year's business has been summed up. So that they are enthusiastic to continue the practice and to urge it upon their neighbors, because they are fully convinced that its benefits are far greater than the possible loss of a few sales of merchandise.

The most plausible argument used against lessened business hours on Sunday is that that asks "what are those who are taken suddenly and seriously ill to do if their wants cannot be supplied?" As a matter of fact the number who are suddenly and seriously taken ill during the few hours the store would be closed are remarkably few, and in these days when nearly all physicians carry pocket cases of medicines for immediate use, this argument loses much of its force.

It is often very hard to do things we are not anxious to do—and remarkably easy to do those things we want to do—and this applies to Sunday closing with as much force as it does in other matters.

After 35 years' experience with partially closing the store on Sunday I am decidedly in favor of continuing it. The only regret I have had is that I did not increase the number of hours closed.

C. A. WEIDEMANN.

About twelve years ago we started to close on Sunday afternoon from one to six o'clock and have continuously been doing so ever since, and we know of no reason, either commercial or ethical, for changing back to the old plan. No trouble has been experienced with any of our customers, as they have always been perfectly fair in conceding that we had a perfect right to the day of rest just the same as they themselves demanded in their own right on their own behalf.

Leaving out of the question the advantages to be derived from the loyalty and earnestness stimulated in the employees of an establishment that always considers their interests as well as the purely commercial phases of a proposition in making rules for management, it is a fact that there has been no loss of business as a result.

It is very rarely that we are disturbed by the ringing of the night bell, and if this is ever done by any one without a real necessity for excuse, service is politely but firmly declined and the person invited to call during the hours set aside for business.

My opinion personally on this question in its relation to the drug business at large is that it will be decided according to the predilections and views of each individual proprietor, and after a few of those having the courage born of a conviction as to what is their just due have demonstrated the feasibility of the movement, it will come to be regarded as a matter of course and accepted as a necessity by the public generally and a large majority of pharmacists themselves.

W. L. Cliffe.

The closing of drug stores on Sunday is a subject of vital interest. That there is an increasing sentiment in favor of a closed Sunday and shorter hours during the week is in line with genuine progress. Every druggist knows that Sunday customers and late customers are such largely through habit, and that genuine emergency cases are very rare, and, in nine cases out of ten, they occur because the drug stores are open waiting for just such trouble. The druggists of any city or town can educate the people in one month to buy their medicines and drug-store supplies on week-days and during proper hours. Were druggists to adhere more strictly to self-respecting business methods, including Sunday closing and shorter hours, they would be more respected by the people, would make fully as much money, enjoy

better health, live longer and be better citizens. Nor need it specially injure a druggist's business to close on Sunday even if his competitors keep open. By closing he and his clerks secure a needed rest and can do better work the rest of the week. By going to church his acquaintanceships are enlarged and forceful traits of character are formed which are of value to a business man. Real emergency cases belong to the doctor, and every doctor should be prepared to treat such without resorting to a drug store. The druggist who stands behind his counter fifteen hours every day in the year is either a slave or a martyr, but his sacrifice is not to science or to humanity, but is laid upon the altar of greed and mammon every time.

JOSEPH A. CONWELL.

Vineland, N. J.

The subject of shorter hours is one which I have been interested in for some time, and I am of the opinion that no two stores can be governed by the same rules. I endeavor to have each of my assistants in the store about 11½ hours each day, and in order to do this, every alternate week two of them begin work at 7 o'clock in the morning, and continue until 9 o'clock at night; two others begin at 8 o'clock and are on duty until 10 o'clock, the closing hour. I am endeavoring to improve this by allowing the men who come at 7 o'clock quit work at 6.30 P.M., thus giving them the entire evening; and to have the other two come on at 8.30 A.M. and work until 10 o'clock.

I have tried the experiment of closing on Sundays between the hours of 1 and 5.30, and have frequently found on my return as many as five or six prescriptions which had been left for compounding and with notes attached, urging that they be sent at once. Inasmuch as the distance they were to be sent was in some cases considerable, such an arrangement necessarily entails considerable inconvenience. On the whole I am an advocate of shorter hours and Sunday closing, and have for years been giving the matter consideration.

THEODORE CAMPBELL.

Overbrook, Pa.

PHARMACEUTICAL MEETING.

The first of the pharmaceutical meetings of the Philadelphia College of Pharmacy, for the season of 1906–07, was held on the evening of Tuesday, October 16, 1906, as a joint meeting with the Philadelphia Branch of the American Pharmaceutical Association. One of the members present aptly paraphrased this meeting as having been helpful, hopeful and inspiring, and in doing so expressed the feelings of pretty much every retail pharmacist present. The meeting certainly was helpful in so far that the discussion which was elicited suggested ample ways and means for bringing about the objects most to be desired. The meeting was hopeful because it evidenced the well-known fact that American pharmacists are desirous of being classed as law-abiding citizens and are anxious to meet their obligations to the members of the community. Above all, however, this first pharmaceutical meeting was inspiring in that it fully demonstrated that pharmacy, in this as well as in other countries, is not devoid of votaries with force of character, willing to assert their rights, as they see them, and able to demand respect by respecting themselves.

While it is practically impossible to adequately portray the spirit that was evidenced at this meeting, some faint conception of the earnestness and ardor that were manifested in the course of the discussion may be gleaned from the following detailed report.

The meeting was called to order by Mr. Howard B. French, the president of the Philadelphia College of Pharmacy, who, after some few well chosen preliminary remarks, introduced Dr. Lawrence F. Flick, Director of the Phipps Institute, Philadelphia, who took as the direct object of his remarks, "Rest and Recreation as a Physical Necessity." Dr. Flick compared the human organism to a machine in that it possessed but limited qualities of endurance, and pointed out the need of remembering that certain mechanical, physiological, and chemical processes that are constantly going on in our bodies, and which are essential to sustain life, all consume energy.

He dwelt at some length on the necessity of keeping the human body in such a state of repair as to enable it to withstand the continuous attack of pathogenic micro-organisms and of other disease-producing factors. A machine is destroyed in proportion to the way it is used or abused, and the human organism may, in the same way,

be destroyed or its usefulness impaired by driving it beyond the natural endurance of the individual organism.

He further pointed out that athletes frequently die young because of overaction of certain of the muscles of the body, particularly of the heart. This overaction may lead to the degeneration of the muscular tissue and thus predispose these tissues to the attack of certain disease-producing factors. Rest, of the proper amount and kind, is essential to maintain the muscular tissues in their proper tone so as to facilitate the resistance to the invasion of micro-organisms of disease and to carry us on to healthful old age.

Rest is also of importance to our physical well-being, and we should always remember that with advancing years the body requires an ever-increasing amount of rest.

Dr. Flick also asserted that recreation, properly used, was in a sense synonymous with rest. The constant use of energy along narrowly defined lines is a great disadvantage, and recreation by consuming energy along lines quite different from those usually followed produces a sense of rest and well-being that cannot always be attained even by absolute rest. The human organism, therefore, not alone requires daily physical rest but also demands recreation or rest of another kind. It has well been said that a hobby is necessary to man as a source of pleasure, it is necessary as a means for recreation and is absolutely necessary as a source of pleasure and diversion in old age.

The Chairman then introduced the Reverend David M. Steele, Rector of the Church of St. Luke and the Epiphany, of Philadelphia, who spoke of "Sunday Rest as a Religious Institution" (see page 508). He pointed out that while man has been variously classed as an animal he could not properly be classed as a Sabbath-keeping animal.

The Sabbath was made for man, not man for the Sabbath. The Sabbath is of use to man, providing he uses it rightly. The proper observance of the Sabbath is largely dependent on the point of view of the individual, but should never be confounded with any of the many co-related subjects that are not themselves directly involved.

Thus he pointed out that church-going is a subject by itself and has nothing to do with the proper observance of the Sabbath.

Breaking the Sabbath by working on it, has nothing to do with and has absolutely no bearing on, the institution of the Sabbath

itself. Desecrating the Sabbath by playing on it, or by using it as a day of recreation, is a problem that is only of importance in that it brings up the question of whether it is right or wrong on any other day. Any rest that we may expect to have on this the appointed day of rest is largely dependent on how we interpret the need for play, work, prayer, or of pleasure, labor, communion.

In conclusion he pointed out that the loss of Sunday as a day for rest, in many instances at least, is largely due to the misuse of the day by workmen.

The next speaker, Mr. Joseph W. England, of Philadelphia, discussed "The Mental Necessity of an Early Closing Movement" (see page 505). He asserted that time is the most valuable asset in a man's life, and judiciously expended provides for mental training, moral training and physical training. The pharmacist has educated the public to expect that he keep his shop open during unduly long hours, and now there is an evident need for him to educate the public into realizing that these hours are not alone harmful to the pharmacist but are actually a menace to the best interests of the public itself. Shorter hours are essentially necessary to the pharmacist to permit of his mental development in the lines followed by him in his daily work. It must be self-evident that if there be no time for thought and study there can be no advancement, consequently no development of the science of pharmacy.

The open discussion that followed the presentation of these communications consisted largely of personal observations, or, "Practical Experiences with Sunday Closing," as announced on the programme. This portion of the discussion was taken part in by a number of the members present and elicited considerable difference of opinion, as to who was to be blamed and how the desired object could best be brought about; practically all of the members present agreeing that shorter hours and at least a partial day of rest were highly desirable.

This portion of the discussion was opened by Dr. Clement B. Lowe, who said, in part, that while he was fully in sympathy with the frequently expressed desire to curtail the hours of work he thought it would be practically impossible in many locations. Dr. Lowe then recounted some of his own experiences with Sunday closing and ventured the opinion that abstaining from unnecessary work was the best that could be done at the present time.

Mr. French, the Chairman, in commenting on the remarks by Dr. Lowe said: "The Chair congratulates Dr. Lowe upon the large amount of business which he is doing on Sunday, but would suggest that he follow the precedent established by some of the barber shops in Philadelphia, and display a sign stating 'Extra Help,' and thus get through with the business in the morning and close his store Sunday afternoon; that in the opinion of the Chair, pharmacists only needed a little more 'back-bone' and independence so as to act independently of what their neighboring competitors do!"

The hour being late the Chairman asked Prof. Joseph P. Remington to preside as he was obliged to catch a train.

Professor Remington, in taking the chair, ventured the opinion that Sunday closing was not alone a possibility, it was a need, an absolute necessity. He further noted the fact that he had before him a number of ardent advocates of rest and recreation and said that he felt confident that they had much to say in favor of their particular hobby.

Mr. Thomas H. Potts, a member of the Executive Committee of the N.A.R.D., asserted that the demand for shorter hours was a reasonable one, but no longer a local issue, it had become a national issue and was sure to be crowned with success. He himself, he said, had closed on Sunday afternoons, for a number of years, and during the coming winter he proposed to close his store at an earlier hour in the evening.

Mr. Stein, of Reading, said he had closed his store on Sunday afternoons for many years, and felt sure that he had not lost anything in the legitimate line of Sunday business.

Professor Kraemer read a paper that had been contributed by one of the veteran pharmacists of Philadelphia, Mr. R. W. Cuthbert, who thoroughly sympathizes with the plea of the retail pharmacist for shorter hours and Sunday rest (see page 503).

Mr. Wilbert called attention to a number of letters that he had received, bearing on the same subject, and asked permission to read abstracts from at least several of them.

A letter from Mr. E. D. Cook, of Trenton, brought with it greetings from Mr. J. G. Bone, of Scranton, who, for many years, has been actively interested in furthering the Sunday-closing agitation.

Mr. Cook on his own behalf also contributed a number of observations and suggestions, in part, as follows:

I hold that the proprietor and his clerks are as much entitled to the Seventh Day rest as any other body of men and there can be no demonstration to prove that they are different beings either in the peculiar character of their mentality, in their moral make-up, or in the physical constitution of their bodies. I believe that it is possible to conduct our business successfully by limiting the duties on Sunday to works of necessity or mercy and abridging the hours of labor so as to give both the proprietor and clerk ample time for rest and attendance at a house of worship if they so elect.

Two questions will no doubt arise in the minds of those who are somewhat sceptical of the "Sunday-Rest Movement" and the first one might be this: If the Sunday-rest movement is such an excellent one why has it not been adopted long ago?

The query seems almost superfluous, but may be answered by saying:

(1) That we do not know how to start.

(2) That we have a natural fear that our business may slip away from us; and no man wants to fast.

(3) We are too much used to the old way.

(4) We ourselves are unwilling to start unless our competitor will do the same.

(5) Some of us at least fight Sunday closing from pure mercenary reasons. This is especially true of druggists who have a large Sunday soda and cigar trade and more particularly of men whose income is increased upon that day because his neighbor refuses to sell such commodities on Sunday.

The second question that might be asked is "Would the proprietors and clerks welcome such an abridgment of their labors?"

Three years ago Mr. J. G. Bone, of Scranton, introduced a resolution, at the annual convention of the N.A.R.D. at St. Louis, that was unanimously accepted; the following year it was again reaffirmed and this year the same welcome victory was accorded it upon its re-presentation.

Would the druggists welcome Sunday rest? Surely yes.

Another letter bearing on the same subject was received from Mr. J. H. Redsecker, Lebanon, Pa., who, in sending his regrets, said, in part:

We have long since taken up the question of shorter hours, in a practical way, and close our store at 9 o'clock. I should, however, be willing to do as other merchants in our town do, close our store every evening at 6 o'clock, except Monday and Saturday evenings. With a view of learning whether or not it was profitable to keep open even this late every evening (9 o'clock), we made a series of observations several years ago, and found that on nights when other business places were closed the increase in business in our store, between the hours of 6 and 9, was only about 7 per cent. on the day's sales, while on Monday and Saturday evenings, when the other stores in town were open until 9 o'clock, the increase was very much larger; some 40 per cent. of the day's sales.

Sunday closing has also been adjusted. We have adopted hours of our own. From 9 to 10.30, from 12 to 1.30, and from 5 to 7 in the evening with one

clerk on only, so that each gets these hours every three weeks. We keep a strict account of our sales and the profits go to charity and to religious work, so that we always have a charity fund to draw on for such purposes.

Mr. Wilbert, in commenting on this letter, said that Mr. Redsecker, in his characteristic, practical way, has evidently solved the shorter-hour problem, at least sufficiently well to demonstrate that if others should accept his findings, or would repeat his observations, they would agree with him that it would pay them to follow the hours for closing adopted by other business men in their neighborhood or town. Mr. Redsecker's disposition of the profits from his Sunday sales appears to be a commendable one, and if generally followed would go far to solve the question of Sunday closing.

Mr. Wilbert then called attention to a characteristic communication which he had received from Prof. C. S. N. Hallberg, of Chicago. This was particularly interesting as illustrating how widespread the present agitation for Sunday rest really is. The communication was in part as follows:

Sunday-rest Agitation Abroad.

As an illustration of the widespread recognition that is being accorded to the evident need for rest and recreation, by the human organism, it may be interesting to call attention to several phases of the agitation and the results so far attained.

In France the recently enacted "Sunday-Rest Law" came into force on September 2d of this year. From the available newspaper reports it would appear that the several provisions of the law are being generally complied with. This general compliance with the really radical innovation of compulsory rest, is somewhat surprising when we remember the nature, tendencies and temperaments of the people themselves. The French people while they are known to be temperate and industrious are also known to be extremely frugal. Their frugality frequently borders on, if it does not closely simulate, avarice and has undoubtedly been the direct cause of the widespread habit of working seven days in the week.

The French Sunday-rest law is the direct result of a movement inaugurated several years ago and is based on the assumption that a day of rest and recreation is essential to the proper conservation of the health of individual members of the community. Sunday was chosen as the most convenient day of rest, not because of religious influences but because a fair proportion of the members of the community were already accustomed to shut their shops and offices and devote that day to other than business purposes.

The law provides that neither workman nor employer in any establishment, either public or private, religious or secular, professional or benevolent, work more than six days in the week, and that the seventh day shall be a day of rest of not less than twenty-four consecutive hours. The second provision declares

that this rest shall be taken on Sundays, except in cases where simultaneous suspension of work by all the employees of an establishment shall be deemed prejudicial to the public or injurious to the best interests of the proprietor. In such cases the employees are allowed to take their rest in turn on other days, but no employee shall be required to work more than sixty hours in each week.

Although druggists, with a number of other individuals engaged in industries the interruption of which would be an inconvenience to the public or cause waste or loss of material, are included in the exceptions from Sunday observance, there appears to be a general feeling among the pharmacists of the larger cities and towns that Sunday observance should be arranged for.

Even in Germany there has been considerable agitation in favor of Sunday rest on the part of apothecaries, and in some of the cities permission has been granted by the Government authorities to close all but one of the local pharmacies in a certain district.

This latter is the method that has been adopted in Switzerland, where pharmacists appear to be much further advanced and better organized than in Germany.

Mr. Theodore Campbell, of Overbrook, related some vexatious experiences that he had encountered by attempting to close his store on Sunday afternoon, and ventured the opinion that it would be practically impossible for him to close on Sunday. He did, however, believe that the hours of work could be curtailed and expected to try it during the coming winter.

Mr. M. M. Osborne, of Elkins Park, a suburb of Philadelphia, said that for years he had closed his store at 8 P.M. during the week, and at 8.30 P.M. on Saturday evenings. His Sunday hours are from 9 to 11 A.M. and from 6 to 7 P.M. He said that he had never found it necessary to bow down to a person who might spend money in his store. What the average pharmacist needs is self-respect; if he cultivates this he will find that he will gain rather than lose by asserting himself in his rights.

The way to close is to close. If pharmacists themselves do not appreciate the need for shorter hours the question will be taken up by the clerks and proprietors will virtually be compelled to accede to their request.

Dr. Mutchler, the Secretary of the Sabbath Rest Association of Philadelphia, being requested to express his opinion on the subject, asserted that druggists can secure Sunday rest if they wish it. He believed the members were taking the matter up in the proper spirit and expressed his gratification at having had the privilege of being present at this meeting.

Mr. Christopher Koch said that he thought it impracticable to close on Sunday. Such a practice would engender the animosity of physicians and cause an increase in self-dispensing. He expressed the belief that the only rational solution of the question was by legislation. Compel all stores to close.

Mr. Clarence H. Campbell thought education preferable to legislation and recounted his experience with his physicians and customers. By securing their co-operation and explaining to them the need for closing on Sunday he believed his week-day business had actually been increased materially.

Mr. J. K. Thum asserted that it is well known that monotony is unfavorable to the higher forms of life. Unless the pharmacist respects himself he is sure to lose the respect of his customers (see page 514).

Mr. Harbold said that the druggist has lost the respect of the public because he stoops to the level of the menial. As the apothecary at one of the large local hospitals he could not see why druggists could not close earlier in the evening as well as close their shops for the greater portion of Sunday afternoons.

Mr. Hugh Campbell said that he had been brought up in a store where Sunday closing had been observed and had always observed it himself. He did not believe that he had lost either trade or friends and certainly felt that he had gained respect.

Prof. I. V. S. Stanislaus said that he could but reiterate what had been said before: "Unless the pharmacist learns to respect himself he cannot exact the respect of his customers."

Mr. A. J. Staudt called attention to the present widespread need for competent help in pharmacy and expressed the opinion that shorter hours would prove doubly helpful in that it would increase the hours for rest of the proprietor and attract better and more competent people to take up the practice of pharmacy.

Professor Kraemer moved that a joint committee of three members each be appointed by the Philadelphia College of Pharmacy, the Philadelphia Branch of the American Pharmaceutical Association and the Philadelphia Association of Retail Druggists to further consider the question of "Shorter Hours and a Day for Rest" and to report at a future meeting.

Mr. Potts moved that a vote of thanks be accorded to Dr. Lawrence F. Flick and the Rev. David M. Steele for their interesting communications. These motions were unanimously adopted. The

chair then announced as the committee of the Philadelphia College of Pharmacy on "Shorter Hours and a Day for Rest," Mr. R. W. Cuthbert, Mr. J. C. Peacock and Mr. Theodore Campbell. The committee appointed for the Philadelphia Branch of the American Pharmaceutical Association is: Wm. L. Cliffe, Mrs. Bertha De G. Peacock and Franklin M. Apple. The committee for the P. A. R. D. will be appointed at the next stated meeting of that organization.

M. I. WILBERT,
Secretary of Conjoint Meeting.

TINCTURE OF NUX VOMICA, U. S. P., 1900[1]

BY JOSEPH W. ENGLAND.

Under the title of Nux Vomica, or Vomica Nut, the seeds of Strychnos nux vomica, W. I., 1052, were officially mentioned by the U. S. Pharmacopœia of 1820, but the tincture of nux vomica was not recognized until the issue of 1850, when a formula was given for its preparation from the rasped seeds by maceration with alcohol in the cold, for fourteen days, expression and filtration; or, maceration for two days, transferal to a percolator, and percolation with alcohol, until the requisite quantity of clear liquid was obtained. The strength was eight ounces of drug to two pints of alcohol.

In the U. S. P. of 1860 and of 1870 the seeds were directed to be used in "a fine powder," and this was digested with one-half the quantity of alcohol, at a gentle heat, transferred to a percolator, and percolated with sufficient alcohol to make the required amount. The strength was eight troy ounces of the drug to two pints of alcohol.

In the U. S. P. of 1880 a more complicated formula was adopted. The seeds in a No. 60 powder were macerated, and then percolated with a menstruum of alcohol 8 parts and water 1 part. The first 90 parts of percolate were reserved, and the remainder of the percolate evaporated to 10 parts, and mixed with the reserved portion. Then the percentage of anhydrous extractive was determined in a small quantity of the mixed percolates, and the finished product

---

[1] Presented to the Scientific Section, American Pharmaceutical Association, September 7, 1906.

adjusted, by the addition of menstruum, to represent 2 per cent. of anhydrous extract.

In the U. S. P. of 1890, the tincture was directed to be made by dissolving 20 grammes of an anhydrous extract of nux vomica containing 15 per cent. of alkaloids, in a sufficient quantity of a mixture of three volumes of alcohol and one volume of water to make 1000 c.c. Each 100 c.c. contained 0·3 gramme of total alkaloids. It was assumed that the strychnine and brucine were present in the total alkaloids in about equal proportion, which would indicate that each 100 c.c. of tincture represented 0·15 gramme of strychnine. As a matter of fact, this assumption was in error, the percentage of strychnine in the total or mixed alkaloids being from one-third to one-half.

In the U. S. P. of 1900 (8th Revision), 20 grammes of a standardized extract of nux vomica containing 5 per cent. of strychnine is directed to be dissolved in a sufficient mixture of three volumes of alcohol and one volume of water to make 1000 c.c. Each 100 c.c. contains 0·1 gramme of strychnine, which, apparently, is a reduction in the strength from the former revision of about 20 per cent.

It is to be regretted that the present issue of the U. S. Pharmacopœia saw fit to continue, practically, the formula of the previous revision, although an attempt has been made to secure a more definite product by using an extract standardized to contain five per cent. of strychnine. This extract, which is in a powdered form, is expensive and tedious to make, readily solidifies (which is due to the sugar of milk present), and when mixed with the official menstruum, it does not form a clear solution, but deposits more or less insoluble matter (apart from the sugar of milk), and on filtration yields a tincture that becomes turbid in time, and precipitates by standing. The writer has examined a large number of the powdered extracts of nux vomica, made by the official process, by leading manufacturers, and in every instance there has been an odor suggestive of caramelization from overheating, and more or less insoluble matter has been left in using them to make the official tincture. Samples of the powdered extracts are submitted together with samples of the tinctures made from them, both before and after filtration. The differences between them, in physical properties, are very apparent.

It has been claimed that strychnine is the only principle of medicinal value in tincture of nux vomica. The writer is not prepared to accept this statement. If true, it means that a solution of strychnine in alcohol and water should yield all the therapeutic results of a tincture made from the drug, and yet we know that the tincture, for some reason or other, is preferred by many physicians, in certain clinical conditions, particularly where the gastro-intestinal tract is involved. This may be due, possibly, to the presence of extractive matter which retards the solution of the strychnine of the extract, in part, or in whole, in the stomach, and enables the strychnine to exercise a local influence (by absorption) as it passes over the mucous surfaces of the intestinal tract. But, be this as it may, the tincture is undoubtedly preferred to the alkaloid by many physicians, in certain clinical conditions, and there must be a reason for it.

Hence, the writer would suggest that tincture of nux vomica be made, not from a standardized powdered extract, which must of necessity yield a product of more or less doubtful therapeutic value, but from an assayed powdered fat-free nux vomica (No. 20 powder), and then standardized to the strength of the official tincture.

The official tinctures of opium and of cinchona are both made from assayed drugs, and the only reason probably that tincture of nux vomica has not been, is because it contains fat, which renders the exhaustion of the drug difficult. But, if the fat be removed with clean petroleum benzin, and dried, this difficulty disappears. The benzin-treatment removes a small quantity of strychnine from the drug, but as the final product is assayed and standardized to contain a definite percentage of strychnine, this loss is of no practical importance.

The last four analyses of powdered nux vomica (not fat free) we have made this year, ran in strychnine content as follows: 1·4, 1·27, 1·25, 1·1 per cent., or an average of 1·25 per cent.

A sample of the tincture made from the assayed fat-free drug and standardized to contain 0·1 gramme of strychnine in 100 c.c., is here submitted.

EDUCATION AND LEGISLATION IN PHARMACY.[1]

By Oscar Oldberg.

Our Pharmacy Laws.—Lord Chancellor Coke of England said that "Law is the perfection of reason." But Lord Coke lived at the end of the sixteenth and the beginning of the seventeenth century. He had never seen our American pharmacy laws which are products of the nineteenth and twentieth centuries. We have made great progress in the past one or two centuries and our laws are now beyond reason.

I can not impose upon your time and patience by presenting here all of the remarkable deviations from the "perfection of reason" which characterize our pharmacy laws; but in order to show you the rate of progress we are making and how much more advanced our most recent laws are than the older enactments I shall quote a few words from the laws passed this year in the District of Columbia and in Iowa. The Act of Congress approved May 7, 1906, provides that applicants for license in the District of Columbia "shall have had at least *four* years' experience in the practice of pharmacy or shall have served *three* years under the instruction of a regular licensed pharmacist, and any applicant who has been graduated from a school or college of pharmacy recognized by said Board as in good standing shall be entitled to examination upon presentation of his diploma." "The bearing o' them observations lays in the application on 'em." Not being endowed with the legal acumen of Lord Chancellor Coke or of our own esteemed Professor James H. Beal I was unable to unravel the inner meaning of that law, so I wrote to the Board of Supervisors in Medicine and Pharmacy of the District of Columbia asking for an official interpretation. The answer I received was that all applicants for license to practice pharmacy in the District must prove that they have had four years' experience, but no light was shed upon the reference to graduates. I then wrote again asking why graduates were mentioned at all since graduation is not compulsory and graduates are not exempt from examination nor given credit in any form for their technical education. The Secretary, in reply, promised to lay this conundrum before the

[1] Portion of chairman's address on Pharmacy Laws and Boards of Pharmacy, presented to the Section on Education and Legislation of the American Pharmaceutical Association, September, 1906.

Board and I may yet be informed of the hidden significance of the lines referring to graduates.

I wish to call your attention to the fact that Congress took the enforcement of the pharmacy law out of the hands of the Board of Pharmacy in the District of Columbia and placed it in the hands of the medical men, reducing the Board of Pharmacy to a committee of examiners in pharmacy without any other functions. Is not that fact a significant straw? If the execution of the pharmacy law is transferred to medical men at the capital, how long will it be before this precedent is followed in the States? Not long, indeed, if the present neglect of reasonably respectable educational requirements continues.

In Iowa the new law which is to take effect October 1, 1906, provides that graduates of reputable schools of pharmacy shall be eligible to take the examination and be licensed without any experience whatever in drug stores. Just think of it!

The Boards of Pharmacy have a hard time of it. With such absurd, vague, contradictory, stupid laws as we have, they find it difficult to remedy the grossest evils. The rights of the people are heartily supported by self-respecting professional pharmacists who favor respectable educational standards. The purely commercial druggist blindly opposes better education because he imagines that educational requirements must hit his pocket-book, and does not care about his obligations to the public.

Politicians and grafters want to use the pharmacy laws for other ends.

Members of the Boards of Pharmacy should be experienced druggists who have been in business on their own account for at least five if not ten years, conducting pharmacies in which the prescription department is a large part of the whole establishment. Every Board member should possess all the educational qualifications which may be reasonably exacted of all licentiates. They should have a general education equivalent to that signified by high-school graduation. Hereafter, since graduation in pharmacy is now a requirement for license in two States, they should also be graduates of good pharmaceutical schools. Not all good practical pharmacists are fit to be Board members. Not all graduates are fit. But men who are both experienced and well educated are the kind that should be selected if they are at the same time matured, broad-

minded, public-spirited men who take a pride in their profession and who will conscientiously study their duties and perform them faithfully without fear or favor.

It affords me great satisfaction to be able to believe that a great majority of the members of the Boards of Pharmacy are competent, broad-minded, public-spirited, conscientious men. But they are not all of that stamp. In our day Tom, Dick, and Harry are unafraid to undertake anything and everything without the slightest special fitness or preparation and other people are generally too timid or too fond of their own comfort and peace of mind to speak out against flagrant abuses. I must confess that I am far from pleased to condemn our system, but I cannot afford to do otherwise.

Plain common sense would admonish us that no man should undertake to be a teacher who has never been a real student himself. No man should accept the post of examiner and then hold examinations which he himself can not pass. No man should accept any public office the duties of which he is unable or unwilling to master. Yet we do have some members of Boards of Pharmacy who are unfitted for their posts.

The great majority of pharmacists, including the Board members themselves, have probably never fully realized the importance of the Boards of Pharmacy and the real dignity and magnitude of their functions when properly understood and fully performed. The duties of Board members are not light unless performed in a merely perfunctory way.

THE POWERS OF BOARDS OF PHARMACY are as a general rule most ample. It would be perfectly safe for the Boards to do all that can reasonably be expected of them to exact higher educational standards.

There are usually two extremes possible in any course of action. In the enforcement of the pharmacy laws one extreme is to place the standards of qualifications for license too high so that the pharmacists can not comply with them without paying a price altogether out of proportion to the value received; the other extreme consists in making the educational requirements for license so low that the public receives nothing in return for the exclusive privileges it gives the pharmacist. Between these extremes lies a navigable channel called *reasonableness*.

The Board of Pharmacy is the umpire which must see to it that

there is fair play. It must do justice to both the public and the pharmacist. There are those who already question the wisdom of turning over the regulation of the practice of pharmacy to the pharmacists themselves. Therefore let the Board of Pharmacy not forget the rights of the public.

The only limit to the power of the Boards of Pharmacy to fix or define the qualifications of applicants for license is the limit of reasonableness. The pharmacy law of Minnesota says nothing about the general preliminary education which should be required of applicants for license. The Board asked the Attorney General of the State whether it had the power to prescribe whatever standard it deemed requisite, grammar-school graduation or high-school graduation. He replied that the Board has wide discretionary powers and can do whatever is reasonable.

The fact is that in most of our States, as the laws now read, the Board of Pharmacy is the sole judge of the qualifications which should be exacted of all persons to whom licenses are issued. The Board has ample power to demand not only one year's high-school work but four years of it if it so decides. It has also the right to demand graduation from a proper school of pharmacy. It has the right to decide what constitutes a proper school of pharmacy. It has the power to examine into the qualifications of any candidate whether by taking stock of what that candidate has done and the examinations he has already passed before any examiners whose ability and honesty are entitled to confidence, or by examinations held by its own members, or by examinations held by examiners of its own selection. It has the power, in its own discretion, to exempt from all examinations graduates who have successfully completed sufficient courses of education in proper pharmaceutical schools; or to exempt such graduates from examination in chemistry, botany, pharmacognosy, materia medica, the theory of pharmacy and any other scientific study adequately covered by their college courses, giving such graduates instead an examination limited to the practical pharmacy of prescriptions and dispensing.

The kind of men who should by all means be members of the Board of Pharmacy must make the very best examiners to test the ability of applicants for license to read and understand prescriptions, to detect errors and dangers in these, to compute doses, and to do the actual work of dispensing in a workmanlike way. I am unable to comprehend why they should insist upon doing more.

The Board of Pharmacy is part and parcel of the State government. It has the power of the State at its back in the enforcement of the law and of all reasonable rules necessary to its proper enforcement. Like other government commissions the Boards of Pharmacy not only can but must learn all important facts having a direct bearing upon their functions. They should invite the opinions and advice of men whose opinions and advice may be of value. They should invite all persons and institutions directly interested to come before them and be heard, and should hear them attentively.

THE REQUIREMENTS FOR LICENSE should be:

(1) proper age or maturity and responsibility;

(2) sufficient mental efficiency attained by proper preliminary general education;

(3) sufficient technical and professional education in a pharmaceutical school; and

(4) sufficient practical pharmaceutical experience or training under proper conditions in pharmacies where really pharmaceutical work is done, including the dispensing of prescriptions.

Satisfactory fulfilment of each of these requirements should be exacted by the Board of Pharmacy which should investigate for itself and demand such evidence as it may deem necessary.

No person should be licensed to learn or practice pharmacy who has not had one or two years of high-school education. No person should be licensed to practice pharmacy either as a principal or as a clerk who has not had sufficient drug-store experience of the right kind. No person should be licensed to open, conduct or manage a drug store unless he has had at least three years' drug-store experience, has served at least one year as a registered assistant, and has graduated from a good school of pharmacy.

It is evident that to the Board of Pharmacy graduation from a school of pharmacy should mean nothing more and nothing less than the successful completion of a sufficient quantity of educational work of the right sort. The educational development and efficiency of the graduate is *the* thing wanted, and that depends upon the quantity and quality of the education. The title or degree of the graduate has no definite meaning, whether it be that of pharmaceutical chemist, graduate in pharmacy, or bachelor, master or doctor. The work at the school is all that counts to the credit of the graduate. The Board should therefore inquire *what* he did, how much

he did, and how much time was taken to do it, and how well it was done.

The *time* of college attendance is in twenty-one States deducted from the drug-store experience required for license. In many of these States the actual number of weeks spent at a college of phar macy are counted, whether two, or twenty, or thirty-six, without reference to whether the student loafed or studied, succeeded or failed, finished the work he had undertaken or left it unfinished. Students who fail utterly at college apparently get as much credit as those who stand high. Clearly no credit whatever should be given for killing time, or for unfinished or unsuccessful school work.

The Board Examinations, judging from the questions used, are in some States very good; in other States very bad. Some examiners seem to think that they must test the qualifications of the candidates as useful commercial salesmen and general clerks instead of testing their efficiency in legitimate pharmaceutical professional work, which is all that the law requires or permits.

The methods and scope of the Board examinations in different States and the kind of questions asked in them, vary extremely. They often seem to be devoid of any plan. One examination sometimes differs from another in the same State in a most remarkable manner.

No information seems to be accessible concerning the nature and scope of these examinations. The candidates cannot know how to prepare themselves. This is unfortunate. Every citizen is entitled to know upon what terms he can secure the right to engage in any lawful occupation.

The disorderly fashion in which candidates for license in pharmacy are struggling to get past the Board might be made orderly.

There can be no sufficient excuse for the enormous proportion of failures in the Board examinations. If the examinations are right then the laws and rules which admit so many unfit candidates to take those examinations must be wrong. In one examination there were sixty candidates and every one failed; in another one hundred and eleven candidates, of whom ninety-eight failed. Such results conclusively prove that we have no sane system. These failures occurred in States where the Board examinations are among the best.

The candidates who failed must all have had several years drug-

store experience or they could not, under the laws of those States, have been admitted to the examinations. Evidently, then, those who insist that drug-store experience is all that is necessary to the proper training of pharmacists are quite mistaken. The drug stores do not teach chemistry, materia medica and pharmacy. All Boards of Pharmacy examine all candidates for license upon those subjects. If the Board examinations are not to include those subjects, then what should they include? If it is proper that these subjects should be included, then let us all know how much of each, how the candidates can best master what they are required to know, and what the schools should do to satisfy these requirements.

Without any definite plan the Boards do not agree with each other, the courses in one school do not agree with those of another school, and it is impossible for the Boards to make their examinations fit the college courses or for the colleges to make their courses fit the Board examinations, or for the bewildered candidates to know what to do to be saved.

PRELIMINARY EDUCATION.—But the most serious evil of all is the inadequate preliminary general education of the apprentices in the drug stores and the students in the colleges of pharmacy. In the absence of any fixed standards the employer is the judge of the educational fitness of the young men who are to be our successors. He settles the question effectually both for the Boards and the schools. Look at the insignificant numbers of the classes that attend schools with proper educational entrance requirements, and the many times as large classes that attend the schools with low admission requirements.

All schools of pharmacy must draw their students from the drug stores.

All schools who uphold high standards would certainly be obliged to close their doors for want of sufficient classes were it not for their endowments, bequests, appropriations, rent-free quarters, and other unusual helps. They need sorely all the encouragement they can possibly get. Shall they be denied that encouragement? Do we want the schools closed? Shall we not rather follow the universal example, heed the universal lesson, and encourage education?

Are we honest to our calling, honest to the public, honest to the young men who would succeed us, when we allow young men to become students and apprentices whose preliminary education is so

wretchedly poor that their career is almost certainly foredoomed to failure? No. Let us repent and reform.

We are told that a large number of graduates coming from practically all the schools of pharmacy are unable to pass the Board examinations. The Boards blame the schools and the schools blame the Boards. Perhaps they are both to blame. Let them get together and find out what the trouble is.

This great Association should be the neutral ground where the Boards and schools can be brought into friendly and proper relations. They can each teach the other some valuable lessons.

And, above all, let us now and here begin to construct an orderly, sane, respectable, workable system of dealing with the regulation of the practice of pharmacy, the promotion of decent pharmaceutical education, the preservation of the professional honor of our craft, and the prosperity of all of our worthy craftsmen.

REASONABLENESS.—No laws are ideal. They are made up of conventions and compromises. This is not only proper but unavoidable.

The pharmacy laws and the rules of the Boards must all be compromises. But several grades of compromises are possible.

The standards we should set up for ourselves as entirely practicable and attainable within ten or twenty years must include high-school graduation and a solid two years' course in a good school of pharmacy.

The irreducible minimum requirements which may very well be put into practice at once are one year's high-school work and a college course of fifty-two weeks divided between two years.

The best plan would, therefore, seem to be one that recognizes these limitations, but which is elastic enough to encourage the higher standards while permitting the lower ones.

High-school graduates should be enabled to complete all qualifications for license as Registered Pharmacists in five years after their graduation from high school, and that period of five years should for the present include either three years of drug-store experience and two years in a pharmaceutical school, or four years' drug-store experience and one year in a school of pharmacy, at their option.

A young man who graduates from high school at eighteen could thus become a Registered Pharmacist at twenty-three.

A young man of seventeen with one year's high-school work to his credit should be enabled to become a Registered Pharmacist in eight years; one with two years' high-school work should be allowed to qualify in seven years; and one having three years' high-school work to his credit should become a Registered Pharmacist in six years.

This graded system would encourage, or at least would not discourage, better education. It would give us more intelligent apprentices and clerks. It would reduce the period of service in drug stores by one year for every additional year of education beyond the irreducible minimum of one year's high-school work. It would require the clerks to serve long enough to become sufficiently matured before they can become principals in charge of stores. It would enable apprentices and clerks to put in two years at a good pharmaceutical school without being punished for it by being made to wait that much longer for their license. It would render it practicable to insist that no one should be licensed as a Registered Pharmacist until after he shall have served at least one year as an assistant. It would enable us to require that no person should be licensed as an assistant pharmacist and thereby authorized to dispense prescriptions and do all kinds of pharmaceutical work unless that person has reached the age of legal responsibility. It would enable owners and principals of drug stores to leave their stores temporarily in the hands of trusted clerks who are licensed assistant pharmacists without violating the law. It would enable hard-worked druggists (whose business does not permit them to specially employ a Registered Pharmacist to take charge during their temporary absence) to attend the annual meeting of the American Pharmaceutical Association or take a reasonable vacation each year instead of making slaves of themselves, thereby greatly reducing their capacity for efficient service to the public.

Let us not have any more beginners in pharmacy whom we would be ashamed to own as our worthy successors. Let us not have any more drug clerks who must be watched by their employer at every turn, or do their work by stealth. I have said elsewhere, let us make the apprentices self-respecting and more contented with their lot by giving them to understand that they are not mere bottle washers though they must wash bottles. Let assistant pharmacists know that they are not non entities but trained practical dispensers

authorized by law to do all kinds of legitimate pharmaceutical work without having their employers looking over their shoulder at all times. Let the clerks know that the only thing a qualified and licensed assistant cannot do in the line of pharmaceutical practice is to run a drug store on his own responsibility, and that the right to do that will come only when he shall have become a Registered Pharmacist.

It is in my humble opinion a grave mistake to ignore the fact that there is and always will be a sufficient difference between the principal and the clerk, and between their respective responsibilities. Both should be recognized by our laws, and higher qualifications should be required for more important duties and responsibilities.

There are those who believe, or profess to believe, that there is no good reason why the principal of a pharmacy should be required to measure up to a higher standard of efficiency than the clerk. It is especially denied that any better protection is afforded the public by a higher standard of education for the principal or manager of the drug store if his licensed assistant should be permitted to perform the usual duties of the dispenser during the temporary absence of the principal in case that temporary absence is extended over several weeks, but it may not have occurred to these objectors that the principal of any pharmacy is the man who controls all the supplies and is responsible for the identity and quality of all the medicinal materials in the shop. He furnishes not only the materials but the tools and other facilities necessary for carrying on the work. The principal is legally answerable for the management of the pharmacy which must be so conducted that the public is properly served and its welfare safeguarded, but the clerk or assistant is responsible only for his own individual services. The clerk dispenses the medicine furnished by his employer and does his work under whatever conditions his employer sees fit to impose. The principal is rightly expected to use his best efforts to see that the materials used are of proper character, purity and strength and his education must be such that he can perform that duty intelligently. No service of that kind is expected of the clerk. If the proprietor of the establishment is absent for a week or a month he still can and does control and direct affairs.

THE IMPORTANCE OF SHOP TRAINING.—The most important part of the training of a pharmacist is sufficient practical experience of the

right kind in a pharmacy of the right kind. There is not to my knowledge any respectable school of pharmacy in this country that does not unequivocally subscribe to that proposition. But no diploma of any school or college of pharmacy entitles its holder to practice pharmacy. It takes a license from the Board of Pharmacy to do that. It is not in any sense the duty of any educational institution to accept the responsibility for any drug-store training.

The Boards should thoroughly understand this question.

Twenty years ago there were only twelve schools of pharmacy in this country. All but one of them required drug-store experience for graduation. Now only four of those twelve schools refuse to confer a pharmaceutical degree without that requirement. These four are the Chicago College of Pharmacy; the Louisville College of Pharmacy; the National College of Pharmacy, of Washington City; and the Howard University School of Pharmacy, also of Washington.

Among the pharmacy schools which formerly required drug-store experience for graduation and which abolished that requirement in 1893 or after that year, we have: California College of Pharmacy, New York College of Pharmacy, Maryland College of Pharmacy, Brooklyn College of Pharmacy, the Universities Wisconsin, Kansas, Minnesota, Northwestern, Ohio, Vanderbilt and several other institutions.

New York is the only State in which any legally binding and fixed standards of efficiency are prescribed governing the recognition of pharmaceutical schools. Twenty-eight schools are registered in New York as complying with those standards. Only one of those twenty-eight schools confers no degree without the drug-store experience requirement.

The American Conference of Pharmaceutical Faculties embraces twenty-six schools. Of these twenty-six the only ones that do not confer any pharmaceutical degree without the drug-store experience requirement for graduation are the Chicago College, the Louisville, the National, and Oklahoma University—four in all.

Among the colleges which confer at least one pharmaceutical degree without the drug-store experience while requiring it for at least one other degree we find: Philadelphia College of Pharmacy, Massachusetts College, St. Louis, Pittsburg, and others.

Not one school or college of pharmacy has ever refused admission

to any student without drug-store experience. No such school ever refused to allow a student to finish his course without drug-store experience. No college requiring drug-store experience for graduation has ever refused to confer its diploma upon any student who finished his college course first and had all his drug-store experience afterwards as soon as he could show that he had had it.

Several things are necessary to make a school of pharmacy efficient, but drug-store experience as a graduation requirement is evidently not one of them. It is entirely possible for the poorest school of pharmacy in existence to demand drug-store experience for graduation and for the best school not to require it. No man who knows enough about the pharmaceutical schools of our country to give his opinion any weight can deny that if the line be drawn between schools that base their diplomas in part upon drug-store training and schools that do not, several of our best schools will be found on either side of the line and several of the weakest as well. It is, therefore, evident that any pharmacy law which calls upon Boards to exempt from examination the graduates of schools retaining the drug-store experience requirement for graduation, and to deny that recognition to the graduates of all other schools, must be regarded as wholly obsolete, stupid, unjust, in many cases discriminating in favor of inferior schools and against better schools, and thereby defeating its own ends.

The pharmacy laws of Alabama, Arkansas, Delaware, Florida, Missouri, New Mexico and West Virginia are now the only laws which authorize the Boards to license without examination the graduates of any college of pharmacy prescribing three or four years' drug-store experience as a graduation requirement. But the Boards of Florida and New Mexico refuse to license any person without examination.

THE AMERICAN CONFERENCE OF PHARMACEUTICAL FACULTIES.

SYNOPSIS OF THE PROCEEDINGS, SEPTEMBER, 1906.

The seventh annual meeting was called to order by President Whelpley at 3.30 P.M., September 5, 1906.

The following institutions were represented:

Albany College of Pharmacy, Brooklyn College of Pharmacy, Chicago College of Pharmacy, Cleveland College of Pharmacy, University of Iowa, University of Kansas, Louisville College of Pharmacy, Maryland College of Pharmacy, University of Michigan, University of Minnesota, National College of Pharmacy, New York College of Pharmacy, Northwestern University School of Pharmacy, Ohio State University, Philadelphia College of Pharmacy, Pittsburg College of Pharmacy, Purdue University, Scio College of Pharmacy, St. Louis College of Pharmacy, Vanderbilt University, University of Washington, and University of Wisconsin.

President Whelpley read the annual address, which reviewed the history of this Conference and the previous efforts in this direction. The address was quite lengthy and contained a large amount of valuable material, ending with a number of recommendations, thirty-one in all. The address was referred to a committee consisting of J. H. Beal, Edward Kremers, and George B. Kauffman.

In the absence of the Secretary-Treasurer, J. O. Schlotterbeck, Chairman Puckner read the secretary-treasurer's report. The treasurer's report was referred to a committee composed of J. T. McGill, William J. Teeters, and W. C. Anderson.

The proposition to amend the by-laws, increasing the preliminary educational requirements, created considerable discussion. The proposed amendment read that the requirements for admission to a school or college shall be:

(1) A minimum age of seventeen years except when a candidate is a graduate of an accredited high-school or of an institution of equal grade, in which case no age limit shall be demanded.

(2) The satisfactory completion of at least one year of work in an accredited high-school or its equivalent shall be demanded.

Dr. Otto A. Wall submitted a mass of statistics and read a paper in opposition to the second section showing that it would be impossible for the St. Louis College of Pharmacy to conform with this requirement. The second section was finally amended by adding "Providing, however, that such requirements shall not apply to matriculants who are bona fide legal residents of Alabama, Arkansas, Indian Territory, Louisiana, Mississippi, Texas, Arizona, Colorado, Idaho, Nevada, New Mexico, Utah, Wyoming and Missouri."

On request of the New York State Colleges of Pharmacy, said colleges were given three years in which to comply with the require-

ments of the Conference regarding the number of hours of instruction given, the colleges agreeing to raise their requirements to 900 hours for the session of 1907–08, 1,000 hours for the session of 1908–09, and 1,100 hours, the Conference requirement, in 1909–10.

The committee to which was referred the President's address, reported favorably on most of the recommendations contained therein and the same were adopted. Among them was the recommendation to raise the annual dues to $5.00 per year, another appointing three delegates to represent the Conference at the coming N.A.R.D. convention, and one providing for a Syllabus Committee to submit a syllabus of a course of instruction. The chairman of this syllabus committee was instructed to confer with the representative of each of the following named bodies: The Pharmacy Council, the Board of Pharmacy, and the Education Department of the State of New York and the National Association of Boards of Pharmacy, as to the practicability of outlining a minimum syllabus of study to prepare for the Board examinations.

There were a number of applications for admission to membership in the Conference, but, owing to insufficient information concerning most of the schools applying for membership, the matter was deferred and a ballot upon these applications will be taken by mail.

Action on the question of degrees was again deferred, W. T. McGill submitting the following:

Resolved, That the American Conference of Pharmaceutical Faculties recommends:

(1) A minimum preliminary educational requirement of secondary *i. e.*, high-school work of four years for the degree of Doctor in Pharmacy, Phar. D.; two years for the degree of Pharmaceutical Chemist, Ph. C.; and one year for the degree of Graduate in Pharmacy, Ph. G.,

which was made a special order of business for the next meeting.

The Nominating Committee, consisting of George B. Kauffman, J. A. Koch, Charles Caspari, Jr., and Francis Hemm, presented a list of nominees for the ensuing year and the following officers were elected:

President, James H. Beal; Vice-President, J. T. McGill; Secretary-Treasurer, J. O. Schlotterbeck. Executive Committee: H. B. Hynson, F. J. Wulling, and W. A. Puckner, chairman.

RECOMMENDATIONS TO THE BOARDS OF PHARMACY.

Adopted by the American Pharmaceutical Association and by the Joint Conference of Boards and Schools of Pharmacy at Indianapolis, September, 1906.

(1) All laws and regulations governing the licensing of pharmacists should make due distinction between apprentices, clerks and principals, and should establish definite minimum qualifications and indicate the rights and duties of each of these three classes of pharmaceutical workers.

(2) No person should be licensed to practise as an assistant pharmacist who has not attained the age of twenty-one years.

(3) The pharmaceutical training and experience required for the licensing of assistant pharmacists should together occupy not less than four years, all of which may consist of drug-store practice, or which may consist of three years' drug-store practice and one academic year's work in a pharmaceutical school, or of two years' drug-store practice and two academic years' work in a school of pharmacy.

(4) No person should be licensed as a registered pharmacist and given the right to conduct a pharmacy who has not served at least two years as an assistant pharmacist, provided, however, that when any licensed assistant pharmacist attends upon the courses of instruction at a school of pharmacy subsequent to the date of his license as such, the time occupied by such school attendance may be deducted from that two years' service.

(5) The pharmaceutical college training and drug-store experience required for the licensing of registered pharmacists should together occupy not less than five years, of which not less than three years should be drug-store experience, and graduation from an approved school of pharmacy should be required of all candidates for license as registered pharmacists.

(6) All candidates for license to practice pharmacy should be required to pass such examinations as may in the opinion of the Board of Pharmacy be deemed necessary. Due credit should be given for successfully completed courses in approved pharmaceutical schools, but all candidates should be examined upon their ability to correctly read and dispense prescriptions.

(7) A preliminary general education of not less than one year's satisfactorily completed high-school work, or its educational equiva-

lent, should be required as a prerequisite to the pharmaceutical experience or apprenticeship required for the licensing of registered pharmacists and assistant pharmacists and for admission to pharmaceutical schools.

(8) In the determination of the fitness of any applicant to receive a license to practice pharmacy, all important facts of his educational history, practical experience and technical services should be taken into account, including his preliminary general education, his special education in pharmaceutical and other related technical schools, his practical experience in pharmacy and the results of the examinations he has passed and an average of these several factors, each assigned its appropriate value, should be adopted as the passing grade.

(9) Definite and uniform conditions of efficiency should be adopted which all pharmaceutical schools must comply with in order to receive recognition by the Boards of Pharmacy in all cases where students and graduates receive credit in any form for the courses they have completed, or for the time of attendance at such schools, these conditions of efficiency to be made public and to be applied equally to all schools.

The conditions of efficiency prescribed for the recognition of schools of pharmacy should relate solely to matters affecting the character of their educational work.

(10) Special education for the practice of pharmacy is in this age a necessity and should as rapidly as possible be made compulsory and the rules of the Boards of Pharmacy should be such as to promote and encourage it in all practicable ways. The special pharmaceutical education required should include substantial laboratory courses.

(11) A syllabus of pharmacy examinations should be prepared, which shall indicate the subjects to be included in the Board examinations as well as in the courses of instruction in the pharmaceutical schools, with the view to the attainment of a reasonably uniform standard of minimum requirements which may be adopted by all boards and schools.

(12) A national committee on examination questions should be appointed by the National Association of Boards of Pharmacy, which committee should include experienced specialists in the subjects mentioned in the syllabus of pharmacy examinations, who shall, under the direction of the said association, prepare questions suitable

for the examinations to be held by such State boards of pharmacy as may avail themselves of the services of said committee.

(13) We recommend to all concerned that the foregoing principles and standards be adhered to in any amendments to the pharmacy laws hereafter proposed in order that national uniformity may be ultimately attained. The minimum requirements indicated, and especially the preliminary general education, should be increased from time to time as circumstances permit. We further strongly urge that the boards of pharmacy employ the discretionary powers already theirs under existing laws to improve the educational status of the pharmacists of the future.

BOOK REVIEWS.

A Text-Book of Chemistry. By Prof. Samuel P. Sadtler and Prof. Virgil Coblentz. Fourth edition. Revised and rewritten. Philadelphia: J. B. Lippincott Company. 1906.

Sadtler and Coblentz's text-book of chemistry—revised and rewritten—has just been issued. Those who have used the previous editions with profit will find the same concise and masterly treatment in this volume which characterized the earlier editions. The first part, treating of Elementary Physics, has been entirely rewritten and is in accord with the accepted views in regard to the nature of matter, and energy in its several forms of action. The chapters on electricity are particularly interesting and valuable, forming, as they do, a concise and up-to-date treatment of not only the modern principles underlying this study, but the most recent applications—particularly of electro-chemistry—in the manufacture of organic and inorganic compounds. The electrolytic methods for the preparation of the hypochlorites, ozone, carbides, iodoform, chloroform, chloral, saccharine and many technical products are given quite fully. A very valuable table on electro-chemical equivalents has also been included in the chapter on Electrolysis and its application.

The part on the chemistry of the non-metals and metals has also been in great part re-written. This also is full of interesting information on many subjects, such as the recently discovered atmospheric gases, the rare earths and metals, radioactive elements, the metallic

carbides, etc. A number of tables have been added which will add greatly to the value of the book for reference by the analyst, as those on critical temperature and pressure, boiling point of water under various pressures, etc.

The chemistry of the organic compounds has been carefully revised and has been enlarged by the addition of a number of new synthetic compounds which are used in medicine and the arts. This part of the book has always been considered to be the most valuable from a didactic point of view. The treatment is clear-cut and the definitions are capable of comparison so that the student is never left in the dark as to the meaning of a name or the definition of a substance and how it differs from some closely related term or substance. Some changes have been made in the classifications, so that the whole consideration is from the point of view of the best authorities in organic chemistry. The care with which the revision of this part of the book has been carried on is best seen in the consideration of the alkaloids theobromine and caffeine, in the light of Fischer's recent work on uric acid; the incorporation of the recent work on isocyclic compounds and their derivatives; the chemistry of tissue-forming substances. This part of the book is remarkably free from the mistakes in botanical nomenclature which are so frequent in books on chemistry.

So long as this text-book by Sadtler and Coblentz is revised, as has been the fourth edition, it will continue to hold a very prominent place as a text-book for students in pharmacy and medicine and will be found a very valuable reference book by every one who requires to consult a work on chemistry.

The illustrations, printing, binding and whole appearance of the book are in keeping with the work of the authors on the contents, and both authors and publishers are to be congratulated on getting out such a satisfactory book. The book comprises 760 pages and can be had for $3.50 in cloth binding and for $4.00 in sheep binding.

PHILADELPHIA COLLEGE OF PHARMACY.

SEMI-ANNUAL MEETING.

September 24, 1906. The semi-annual meeting of the members of the Philadelphia College of Pharmacy was held this afternoon at 4 P.M. The President, Howard B. French, presiding. Twenty-three members were present. The minutes of the quarterly meeting, held June 25th, were read and approved. The minutes of the Board of Trustees for the meeting held June 5th were read by the Registrar and approved.

The Committee on Nominations presented their report, which was accepted. Dr. C. B. Lowe, for the delegates to the American Pharmaceutical Association, made an interesting verbal report of the recent meeting held at Indianapolis.

The following named gentlemen, previously reported, were elected to honorary membership: Fernand Ranwez, of Louvain, Belgium, and John Merle Coulter, Chicago, Ill.; and to corresponding membership: Pierre Élie Felix Perrédès, London, England; Frederick Alfred Upsher Smith, Chesterfield, England.

The President appointed the following named committee on membership: W. A. Rumsey, Chairman; Henry Kraemer, H. L. Stiles, James T. Shinn and C. A. Weidemann.

The election of trustees being next in order, Messrs. Rumsey and Moerk having been appointed tellers, a ballot was had, when Miers Busch, Aubrey H. Weightman and Wallace Procter were declared elected for the ensuing three years.

ABSTRACTS FROM THE MINUTES OF THE BOARD OF TRUSTEES.

The meeting was held June 5, 1906. Committee on Library reported a large number of accessions to the Library, many of them by donation.

The Committee on Accounts and Audit reported that they examined the accounts of the Treasurer, Registrar, and of the AMERICAN JOURNAL OF PHARMACY and found them correct.

The Committee on Announcement reported that the contract for printing the Announcement for 1906 had been awarded, and that the announcement would be issued promptly.

Mr. French alluded to the death of Hon. Robert Adams, who was the speaker on the occasion of the last Commencement, and suggested that a note of his death be made on the minutes.

The Secretary was instructed to send a letter of thanks to Rev. David M. Steele and Rev. Dr. Edwin H. Delk for their services during commencement exercises.

Professor Remington referred to the Baccalaureate services as being a great feature of our Commencement and hoped for a continuance of these interesting occasions. Mr. Rumsey expressed much pleasure to know that members of the Alumni Association had taken an interest in the Commencement by being present on the stage. He favored issuing a card giving the events of Commencement week, and moved that a committee be appointed to do this. This met with approval and it was ordered that such a committee be appointed, Mr. Rumsey to act as chairman and to select his associates.

An appropriation of two hundred dollars was made to the Alumni Association.

Mr. French referred to the scholarship offered to graduates of the Philadelphia Public Schools, and suggested a notice be sent to the Superintendent of Public Schools regarding the several scholarships offered.

Four names were proposed for active membership, to be acted on at the next meeting of the Board of Trustees.

J. S. Beetem,
Sec. pro tem.

REPORT OF THE COMMITTEE ON NECROLOGY.

During the past year the college has lost by death eight members, one of these being a corresponding member.

Dr. Carl Schacht, who died in Berlin on November 6, 1905, was a corresponding member of the college for a number of years. He was one of the founders and the first president of the German Pharmaceutical Society and was well known for his work in connection with the revision of the German Pharmacopœia. He was a native of Berlin, having been born in that city in 1836. He was educated at various German universities and took his doctor's degree at the University of Berlin in 1862, the subject of his thesis being "Oleum Macedis." On the retirement of his father, in 1864, he became the

owner of the *Polnische Apotheke*, in which he had an interest until 1894, when he in turn handed the business over to his son. He was not only a practical druggist but was known for his original investigations on pharmaceutical subjects.

Dr. John Bley, who died on August 22, 1905, at Los Angeles, was a life member of the college, having joined in 1868.

Robert C. Brodie, who died on January 4, 1906, in this city, was eighty-one years of age at the time of his death. He was elected a member of the college in 1845, and had therefore been a member for sixty years, there having been few members who were connected with the college for a longer period than he. Mr. Brodie was in the drug business fifty-six years, retiring from business in 1903. For many years he was treasurer of the Philadelphia Wholesale Drug Company, and served St. Alban Lodge, No. 529, F. A. M., in the same capacity for twenty-five years. He was the father-in-law of our late Registrar, W. Nelson Stem.

Dr. Joseph P. Bolton died on February 24, 1906. He graduated from the college in 1860 and became a member in 1867. He was a graduate of Jefferson Medical College, in which institution at the time of his death he was demonstrator of chemistry, and also assistant neurologist at the Jefferson Hospital. He resided in Germantown, where he had conducted a drug store for a number of years.

Henry Cramer, of Germantown, who died on July 28, 1905, became a member of the college in 1866. He was of German birth and was not a graduate of the college. For a number of years he was a member of the firm of Cramer & Small, at 320 Race Street. He was much interested in the work of the college and sent a communication to the Procter Memorial meeting, held November 15, 1905, which was a beautiful tribute to Professor Procter.

Edward Tonkin Dobbins died at the University Hospital on February 17, 1906, as the result of a fall in the street near his home. Mr. Dobbins was born at Pemberton, N. J., May 29, 1841. He graduated from the college in 1862, became a member of the American Pharmaceutical Association in 1867, and of the college in 1898, being elected a member of the Board of Trustees in the succeeding year. His will provided for the establishment of a scholarship in the Philadelphia College of Pharmacy to be known by his name. Mr. Dobbins first started in the drug business as an apprentice with

William B. Webb, corner of Tenth and Spring Garden Streets, and entered the employ of John Wyeth the year of his graduation, first in the retail department; later he entered the manufacturing department. He then became a member of the firm and was for a number of years second vice-president of the firm, but for some years past had not been active in its management. He was one of the early members of the Union League, Philadelphia; was a member of the Colonial Society of Pennsylvania, the Sons of the Revolution, and of the Country Club. He was interred at St. Andrew's Churchyard, Mt. Holly, N. J., near the chapel there, which was erected by his family as a memorial chapel some years ago, in 1879. Mr. Dobbins was a man of great integrity, always ready to help those in need, and his kindly assistance will be missed by many.

Louis Koch died on February 24, 1906. He joined the college and the American Pharmaceutical Association in 1872, and though not a graduate of pharmacy, took considerable interest in the development of the professional side of pharmacy.

Allen Shryock died on November 14, 1905. Mr. Shryock graduated from the college in 1860 and became a member in 1870. Mr. Shryock was in the drug business for a number of years. He was a teacher of music at the time of his death.

THE PHILADELPHIA BRANCH OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION.

There are probably but few present-day activities that promise to have a more far-reaching influence on the rise and the development of the science of pharmacy, in the United States, than the organization and support of the Council on Pharmacy and Chemistry by the American Medical Association.

The work that has been undertaken by this Council, while thoroughly well appreciated by the leading medical practitioners of this country, does not appear to be so well known to, or at least is not so thoroughly well understood by, the average retail pharmacist. This evident lack of appreciation and interest on the part of the pharmacist is all the more unfortunate in that no class of persons

will or can derive the same amount of material or moral benefit from a proper appreciation and support of the work undertaken by this Council.

For many years pharmacists have complained that their prescription work is decreasing in amount and in profit, and that physicians are either dispensing their own medicines or are confining themselves more and more to prescribing ready-made proprietary preparations, the dispensing of which left little or no profit to the pharmacist.

Despite the marked changes that have been brought about in the practice of pharmacy itself, comparatively few of its votaries have been impressed by the fact that the reduction in the number of prescriptions, the increase in the use of proprietary medicines, and the corresponding decrease in the profitableness of the prescriptions dispensed are all due largely, if not entirely, to their own lack of interest in the more professional side of their vocation, and to the accompanying lack of practical knowledge of the needs and the wants of medical men.

To give retail pharmacists an opportunity of becoming more thoroughly acquainted with the objects, needs, wants and accomplishments of the Council on Pharmacy and Chemistry of the American Medical Association, it is proposed to devote the November meeting of the Philadelphia Branch of the American Pharmaceutical Association to the discussion of various phases of:—

The Work of the Council on Pharmacy and Chemistry of the American Medical Association.

The November meeting of the Philadelphia Branch will be held in the lower hall of the College of Physicians, northeast corner of Thirteenth and Locust Streets, on the evening of Tuesday, November 6, 1906, and the discussion will be opened by the following communications:—

Prof. S. P. Sadtler: The Work of the Council on Pharmacy and Chemistry of the American Medical Association.

Dr. Alfred Stengel: The Endorsement of the Work of the Council by Medical Practitioners.

Prof. Charles H. LaWall: The Effect of Publicity on the Standing and the Use of Nostrums.

Prof. W. A. Puckner: The Needs of the Council on Pharmacy and Chemistry of the American Medical Association.

THE AMERICAN
JOURNAL OF PHARMACY

DECEMBER, 1906.

THE ROOT-STRUCTURE OF SPIGELIA MARILANDICA L., PHLOX OVATA L. AND RUELLIA CILIOSA PURSH.

By Theo. Holm.

(With five figures drawn by the author.)

In the very comprehensive work of Dr. Solereder,[1] dealing with the anatomy of dicotyledonous plants, the *Polemoniaceæ* are characterized as lacking crystals, with the only exception of *Phlox Carolina*. But in this plant, better known as *Phlox ovata* L., Dr. Solereder states that Professor Henry Greenish[2] has found large, fusiform cystolithes in the cortical parenchyma of the roots.

Having for several years been engaged in studying the anatomy of our native plants, the writer has always been desirous of comparing the anatomical characters of the various families. While examining the structure of the *Acanthaceæ* that occur in the vicinity of Washington, I noticed a very peculiar structure, especially in the roots, which led me to undertake a more detailed investigation of certain tissues with their cell-contents, and quite especially the cystolithes. Being well acquainted with Professor Greenish's original paper and his carefully executed figures of the cystolithes, which he thought to have detected in *Phlox ovata*, I extended my investigation to some members of this family, including this particular species. However, I failed to observe any crystals or cystolithes, and inasmuch as Professor Greenish was not so absolutely certain that the roots and rhizomes, which he had before him, really belonged to some *Phlox*, I commenced to doubt the correctness of the statement that the roots of *Phlox ovata* contain cystolithes. It

[1] Systematische Anatomie der Dicotyledonen. Stuttgart, 1899, p. 622.
[2] *The Pharmaceutical Journal and Transactions*. London, 1891, p. 839.

would, indeed, be very strange if a single species of a family that contains about 150 species, should possess such marked characteristics unknown from any of the others.[1]

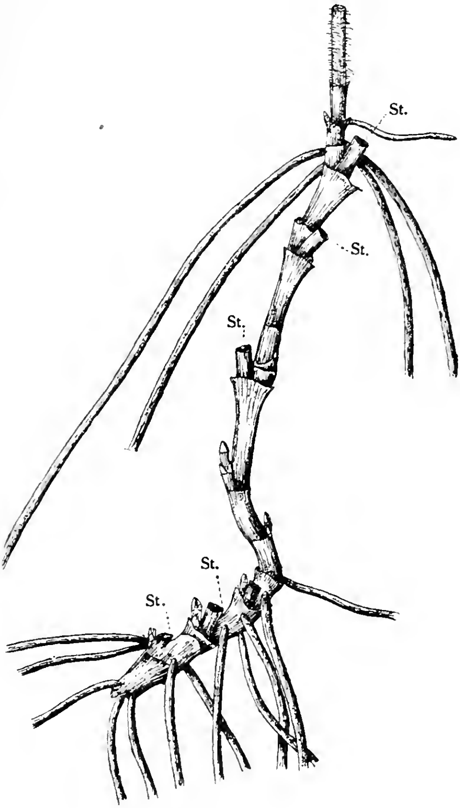


FIG. 1.

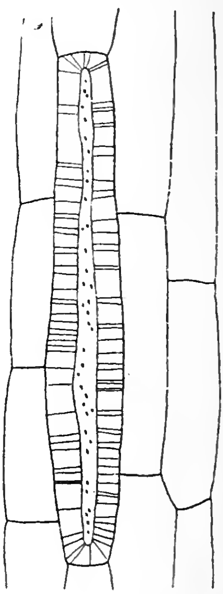


FIG. 2.

Fig. 1. *Ruellia ciliosa*, Pursh. The rhizome of an old specimen showing the basal portions of the aerial shoots still attached (St.). This rhizome shows several stretched internodes and some very short ones at the base, both forms often occurring at the same time in this species; natural size.

Fig. 2. Longitudinal section of the same root, showing a stone-cell. × 480.

From this point of view the writer wishes to present a few data about the root-structure of *Phlox ovata*, and to demonstrate that

[1] After this paper had been written I happened to see an article about the same subject by Mr. W. W. Stockberger in *Proc. Am. Pharm. Assoc.*, 1905, p. 324, who has reached the same conclusion.

the plant described by Professor Greenish was no doubt a species of *Ruellia*, and probably *R. ciliosa*, Pursh.

The specimens examined by Professor Greenish were " a broker's sample of *Spigelia* root," and " a bold sample !" They differed from true *Spigelia* in their " straighter, thicker and less wiry rootlets and smoother rhizome, from which the cup-shaped scars that characterize *Spigelia* were absent, the lower portions of the aerial stems frequently remaining still attached." These characters led Professor Greenish to believe that he was dealing with *Phlox Carolina*, the root of which has been substituted for that of *Spigelia Marilandica* in the United States. Now in regard to the identification of these supposed *Spigelia* rhizomes, Professor Greenish compared them with

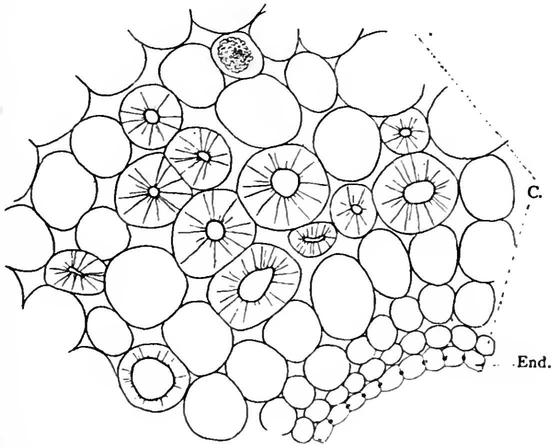


Fig. 3. Same species. Transverse section of a secondary root. C = the cortical parenchyma with one cystolithe and several stone-cells with narrow lumen and heavily thickened, porous walls ; End. = endodermis with the Casparyan spots. $\times$ 480.

herbarium-specimens of the *Phlox*, which were unfortunately mostly without roots. There is no statement to the effect that Professor Greenish examined the root-structure of the true Phlox, which, as stated above, was merely represented by rather defective herbarium-specimens.

The anatomical structure of the supposed *Phlox* roots is described and illustrated by Professor Greenish, who calls attention to the " numerous stone-cells and cystolithes," and it is on account of this diagnosis that *Phlox Carolina* has been mentioned by Dr. Solereder

as an exception, in regard to the occurrence of cystolithes, from all the other members of the *Polemoniaceæ.*

However, the roots of true *Phlox ovata* show the structure as follows: There are many root-hairs, and inside epidermis is an exodermis, a single layer of pentagonal cells (when viewed in transverse section), which are thin-walled and about as large as the adjoining cells of the cortical parenchyma. The cortex consists of about twelve layers, of which the peripheral two or three are slightly thick-walled, the others are thin-walled and constitute quite a compact tissue, the intercellular spaces being narrow.

A thin-walled endodermis surrounds the continuous pericambium, inside of which are many groups of leptome and rays of vessels with strata of moderately thickened conjunctive tissue. No crystals occur in any of these tissues: no "stone-cells" and no "cystolithes." The structure agrees in all respects with that of the roots of other species of *Phlox* examined for this particular purpose.

If Professor Greenish had had access to some more complete specimens of true *Phlox ovata*, he would have observed that their root structure does not differ much from that of *Spigelia Marilandica*, which may be described as follows: Epidermis and exodermis as above, but the cells of the latter are not so wide as the adjoining cortical parenchyma. Cortex consists of about fifteen thin-walled and compact strata. Endodermis is thin-walled, and the pericambium shows numerous cell-divisions, besides that the stele has commenced to increase in thickness; the conjunctive tissue is thick-walled. No crystals or cystolithes were observed. The structure is, thus, almost identical with that of true *Phlox ovata.* While thus the roots of *Phlox* and *Spigelia* look very much like each other, the rhizomes are very distinct, and no species of *Phlox* posesses a rhizome that in any way can be compared with that of *Spigelia:* with the "cup-shaped scars" from the dead stems and the somewhat matted roots, developed from the "very short internodes of the rhizome."

It was, therefore, no difficult matter to decide that the plant described by Professor Greenish was no *Phlox* and of course no *Spigelia* either. But what was it? As mentioned above, the writer had commenced a study of the *Acanthaceæ*, and it so happened that one of these, *Ruellia ciliosa*, showed a root-structure so characteristic that I feel confident that this is the plant which was confounded with *Phlox Carolina* and sold as a substitute for *Spigelia* in accordance with Professor Greenish.

The root-structure of *Ruellia*, when examined under the microscope, is widely different from that of *Spigelia*, but the rhizome, at least its external structure, resembles that of *Spigelia* much more than any species of *Phlox ;* to the non-critical examiner the rhizomes of *Ruellia* may easily be taken for true *Spigelia*. In order to guard against any such mistake the following points may be recorded.

Fig. 1 represents a mature rhizome of *Ruellia ciliosa*, Pursh, more than seven years old. The lower portion of this rhizome shows a more condensed growth and shorter internodes than the upper part, which is almost vertical and of which the internodes are stretched.

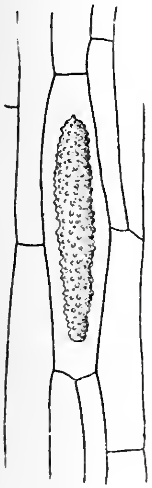


FIG. 4.

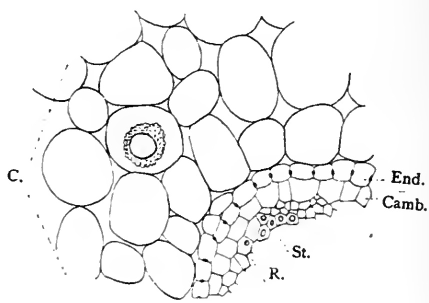


FIG. 5.

Fig. 4. Longitudinal section of the same root, showing a cystolithe. × 480.

Fig. 5. Transverse section of another root, but of the same species, showing the cortex (C.) with a cystolithe, the endodermis (End.), the pericambium (Camb.) and the leptome with a cell containing a raphidine (R.) and some stereomatic cells (St.). × 480.

Such difference in growth is commonly to be observed in *Ruellia*. The basal part of the aerial shoots remain attached, as may be seen from the figure, thus the cup-shaped scars so characteristic of *Spigelia* are absent. The roots are long, sparingly branched, and generally coarser than those of *Spigelia*. If we now examine the internal structure of the *Ruellia* rhizome, we notice at once the abundance of cystolithes in the cortex and pith, while these are totally absent from the rhizome of *Spigelia*.

In cases where the rhizome of *Ruellia* may be less represented, the roots alone are sufficient to prove that they belong to this genus and not to *Spigelia.* The most conspicuous and reliable features by which the roots of *Ruellia* may be characterized consist in as follows: The hairy epidermis and thin-walled exodermis surround the cortical parenchyma, which consists of about twelve layers of cells, thick-walled in the two peripherals, but thin-walled in the others. In this parenchyma, the cortical, we notice (in transverse sections, *Fig. 3*) a number of thick-walled cells with the walls porous and the lumen quite narrow; our *Fig. 2* shows one of these "stone-cells" in longitudinal section, surrounded by thin-walled cortical cells. And in this same parenchyma, the cortex, we notice, furthermore, the presence of numerous cystolithes with distinct granulose surface (*Fig. 4*, longitudinal section); viewed in cross-sections the cystolithes (*Fig. 5*) are seen to be hollow, but quite thick-walled. In other words, we have before us exactly the same structure as illustrated so very well by Professor Greenish of his supposed *Phlox Carolina.* Inside the cortex is a thin-walled endodermis, which borders on a thin-walled pericambium. The stele consists generally of four broad groups of leptome alternating with four rays of vessels which extend to the centre of the root, there being no conjunctive tissue in the central portion.

While thus the presence of these large cystolithes and sclerotic cells make the structure readily distinguishable from the roots of *Spigelia* and *Phlox,* there are two other characters noticeable in *Ruellia,* which are equally striking: The presence of stereids in the leptome (*Fig. 5*) and of raphidines also in the leptome. Of these the former are thick-walled, prosenchymatic cells, while the latter, first detected by Russow,[1] remind very much of raphides, and are known only from the *Acanthaceæ.* The raphidines may be single or many together in one cell of the leptome, but they are often difficult to find on account of their diminutive size. The cystolithes, on the other hand, can hardly escape the attention, and these are very characteristic of the family *Acanthaceæ,* occurring in the vegetative organs of these: the stem, the leaf and the root. But they are also known from a few other families, for instance: *Cucurbitaceæ, Boragineæ* and *Urticaceæ,* none of which, however, may be mistaken for

---

[1] *Sitzungsber. Naturforsch. Gesellsch. Dorpat.*, Vol. V, 1881, p. 308.

Spigelia, as far as we know the *Spigelia* root and rhizome of the Pharmacopœia.

While thus the roots of *Spigelia* may be readily distinguished rom those of *Ruellia*, I intend to illustrate the anatomical structure of the parts above ground of these plants, in a subsequent paper, in order to make the distinction as plain as possible.

Brookland, D. C., October, 1906.

UNITED STATES ARMY LABORATORY.[1]

By C. Lewis Diehl.

When I graduated in the Philadelphia College of Pharmacy in 1862, it was my earnest wish that I might have the opportunity to engage in the practical production of pharmaceuticals and chemicals on a manufacturing scale. This opportunity came to me during the late spring of that year, when I received a position with John Wyeth & Brother, who were then engaged in filling large contracts to supply the Army with drugs and medicines, and assigned to me the charge of their laboratory about to be opened for the manufacture of such pharmaceutical preparations as could be profitably made by them. Comfortably and satisfactorily situated, in a position in every way comporting with my ambition, I was rudely awakened from such dreams as are possible only to youth, by the reverses to our Army, by the invasion of Maryland, by the disaster at Antietam; and, though loath to relinquish a position in every way desirable, I enlisted in the 15th Pennsylvania—the so-called Anderson—Cavalry in fulfilment of a duty which had been delayed only by reason of the obligation to serve the full term of my apprenticeship and the desire to complete my courses in the College of Pharmacy.

Returning convalescent, after having been wounded at Murfreesboro and discharged from the Army, I naturally applied for a re-engagement by the Messrs. Wyeth, but found at the time no opening, the management of the laboratory having been entrusted to satisfactory hands. It was intimated to me, however, that there might be

---

[1] This article was prepared at the request of Mr. M. I. Wilbert and presented to the historical section of the American Pharmaceutical Association in 1905.

an opening for me in the Army Laboratory that was about to be established in Philadelphia, and, thanks to the Messrs. Wyeth and to Prof. John M. Maisch, whose acquaintance I had made under favorable auspices, I succeeded in obtaining the appointment of *Assistant Chemist* under Professor Maisch.

More than forty years have elapsed since I entered upon my duties in the United States Army Laboratory at the N. E. corner Sixth and Oxford Streets, Philadelphia (during April, 1863), and I depend altogether on memory, with the slender reminder of several photographic interiors, for what I am about to say. The grounds on which the laboratory was situated occupied a parallelogram of, I should say, about 150 to 175 feet. The main building, three stories high, with a well-lighted basement throughout, faced west on Sixth Street, flush with the pavement, about 100 feet long and joining a one-story building on Oxford Street, facing south, about 60 or possibly 75 feet long, and perhaps 60 feet in depth, while on Sixth Street, or the main front, it was separated by a gateway from another one-storied structure, extending eastward about 85 to 100 feet and constituting the northern boundary of the grounds. The remaining portions of the northern and southern boundaries were enclosed by a wooden fence, as was also the rear, or eastern boundary, when the laboratory was first opened, but in time was occupied by a frame structure, running the entire length, and used for the washing and storage of bottles, the carpenter-shop and other similar purposes. The only entrance into the laboratory from the street was an ordinary doorway, immediately adjacent to the gateway mentioned, which was for the exclusive use of teams. The doorway opened into a short, rather narrow passage, to the left of which was a small office, and immediately adjoining this the private office of the Superintendent, Surgeon A. K. Smith, and of the Chief Chemist, Professor Maisch, who, however, used it chiefly as an experimental laboratory. Through the short passage mentioned, leading into the packing room, the employees had to pass on their way to and from their work, and consequently under surveillance from the office—those employed on the upper floor of the main building reaching their stations by a single (and only) stairway along the east wall of the packing-rooms—the latter occupying about one-half the space of the first floor, minus the space occupied by the offices and hallway. The remaining half of the first floor—composing the

southwest corner of the main building—was the mill-room, where the drugs used were ground and pulverized for further treatment or final disposition; this important department being provided with numerous mills, sieves, etc., of suitable variety, size and construction to meet the requirement of the time. Immediately adjacent to this mill-room, in the one-story structure on the Oxford Street (south) side of the building complex, was the laboratory for operations requiring the application of steam, the entire structure being occupied by this, with the exception of a space in the northeast corner in which the engine and boilers supplying the necessary steam were enclosed—a space over the boilers being so constructed as to form a drying-room, which was conveniently reached by a door from the mill-room.

The steam laboratory which was reached from the mill-room by a descent of three or four steps, and from the yard on a level through a door in the northern part, was a lofty apartment, possibly 18 feet high, and 60 by 60 feet in area, with open transoms for ventilation and with windows on the northern (yard) and southern (Oxford Street) fronts for light as well as ventilation. This department was under the charge of Mr. Henry W. Scheffer, now of the well-known St. Louis firm of Larkin & Scheffer, and was devoted to the various operations of solution, percolation, distillation, and other operations necessary in the manufacture of solid and fluid extracts, of morphine and strychnine, and the preparation, crystallization, or granulation of certain salts, such as acetate of zinc, Rochelle salts, alum, lead acetate, ammonium muriate, copper sulphate, etc., etc.

In the yard, in close proximity to the northeast corner of this steam laboratory, was a small but lofty one-story structure, enclosing the ether, chloroform, and nitrous-ether stills, the condensing apparatus being situated on a platform composing a sort of second floor, from which the condensed ethers were conducted into receptacles within convenient reach of the operator at the stills. Needless to say that the source of heat in this isolated building was steam from the boilers, and that flame of any description was strictly tabooed.

During the first period of my connection with the laboratory, this, the so-called ether room or department, was under my charge, in connection with my specific duties, the operations requiring the application of direct heat; but later on this department was given in charge of Mr. John (?) Pearce, a graduate of Yale College (or

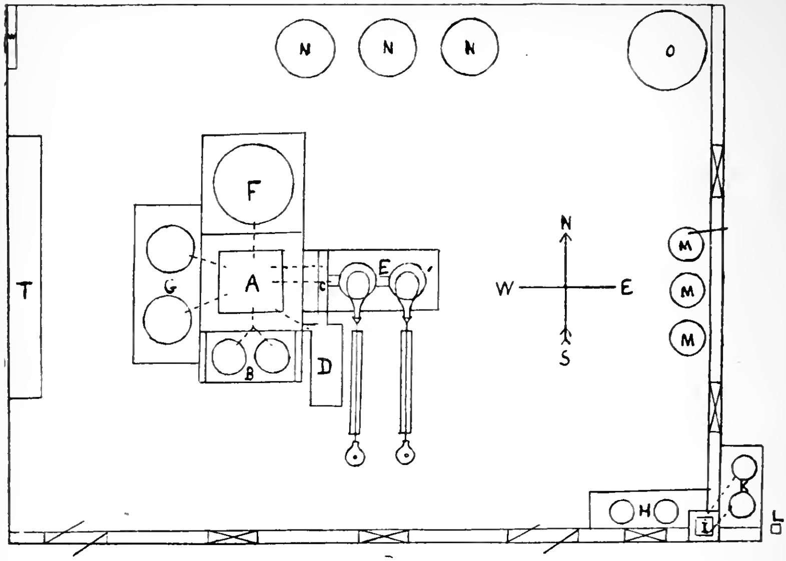


FIG. 1.—Diagram of Furnace Room. Flat Inspection.

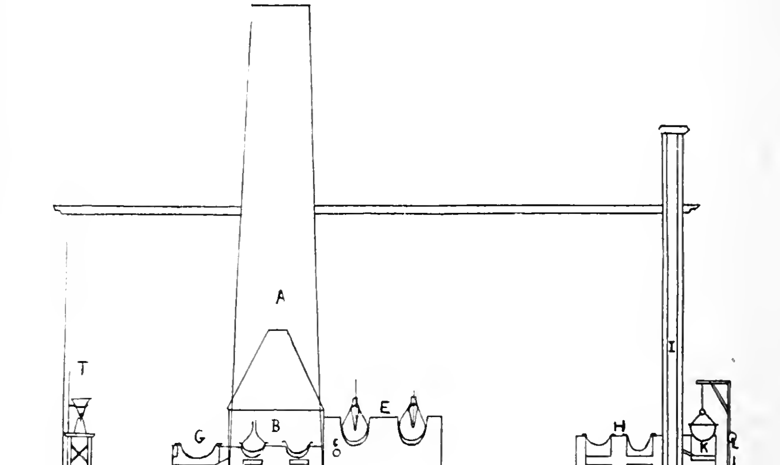


FIG. 2.—Diagram of Furnace Room. Elevation.

was it Harvard ?) and an accomplished chemist, who had been my assistant. It would doubtless be interesting to give a description of the manufacture of ether, chloroform, etc., and the apparatus employed, but these were essentially the same as those then practiced and in use in the laboratory of Dr. E. R. Squibb, and probably still in use, and have, I believe, been sufficiently described heretofore. I shall therefore confine myself to a description of the operations in the so-called furnace room, which practically composed the sum total of my experience in the U.S.A. Laboratory.

THE FURNACE ROOM.

This was situated in the one-story structure initially mentioned as constituting the northern boundary of the laboratory site, extending eastward from Sixth Street for a distance of possibly 85 or 100 feet, and occupied about 50 feet of the extreme eastern side of this structure. I have prepared two sketches (*Fig. 1* and *2*), the one showing the arrangement of this room, and the various furnaces in flat perspective, the other in elevation, which may serve to elucidate my description of the various operations.

Around a central stack (*A*)—not however, central in its position towards the encircling walls—four sets of furnaces were grouped as shown, the purpose of which will be explained as we reach the operations for which they were constructed. A smaller stack (*I*), situated in the southeast corner of the room, admitted the flues from a set of furnaces on the interior, and also from another set on the exterior of the building. Along the eastern wall there were several solid leaden tanks (*m*, *m*, *m*,) for sulphuric acid mixtures, while large wooden tanks (*n*, *n*, *n*,), of various capacities, were ranged along the blank northern wall of the room. The general work table (*T*), for small operations requiring gas as fuel, for filtrations, etc., was placed against the blank western wall—a wardrobe (*W*), fitting a space in the corner, while along the front (southern) wall, between the two doors, were the sinks, water supply, and various vessels, such as earthen-ware crocks, etc.—for such use as might be. The room was lofty, well-lighted, paved with brick, but, so far as I can now recall, was not provided with facilities for ventilation other than the doors and windows.

Before giving in brevity a description of the uses to which the different furnaces and appliances were put, I should mention that

during my incumbency I had as principal assistant, Harry Grant, a very respectable and gentlemanly young fellow, who, though classed as a laborer, performed his duties intelligently and proved very valuable; other assistants, ordinary laborers, were put into requisition as exigency demanded.

Beginning then at the hooded furnace (*B*) shown in the half-tone picture (*Fig. 3*), this served the purpose of a fume chamber, and was, as this designation implies, used for operations during which noxious fumes were disengaged. The furnace openings were closed

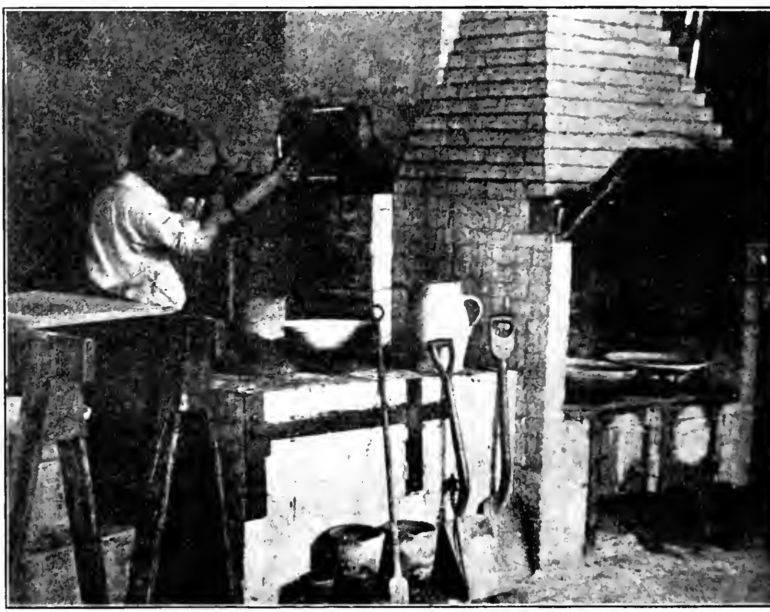


FIG. 3.—Hooded Furnace.

with shallow sand baths for the reception of porcelain dishes or other vessels required for the operation in hand. Thus, on one of them (in *Fig. 2*) is shown a porcelain capsule with an inverted funnel which was used for the manufacture of

Phosphoric Acid from phosphorus by oxidation with concentrated nitric acid. The latter having been placed into the capsule in sufficient quantity, a large funnel was inverted into the capsule, of such dimension that its edges just dipped into the acid. From time to time sticks of phosphorus were introduced, which were rapidly

attacked, with abundant evolution of nitrous vapors and finally dissolved and converted into phosphoric acid. When sufficient phosphorus had been converted in this way, the excess of nitric acid was driven off, the acid diluted, tested for arsenic, if necessary freed from it, and then diluted to the proper strength. Large quantities of diluted phosphoric acid were thus made. Or the capsule was used for the preparation of

Mercuric Nitrate, by the direct action of nitric acid upon metallic mercury. The very handsome pale yellow mass of crystals obtained was then heated until the salt was perfectly dry and more or less powdery, and the heat being increased carefully, it was finally converted into

Mercuric Oxide, which was obtained in this way in form of beautiful bright-red minute crystals, very superior in appearance to the oxide as ordinarily supplied.

Silver Nitrate was another salt that was made in this furnace in large quantities, and almost continually for long periods. The silver for this purpose was supplied by the U. S. Mint, and was 99.5 per cent. pure, the 0·5 per cent. being copper. Small as this percentage was, in working up a hundred ounces of the metal—the usual quantity—considerable copper nitrate accumulated in the mother liquid, so that only the first crop of crystals, after washing with a little ice cold distilled water, could be utilized without re-crystallization. The remainder, amounting to one-third or even less of the entire quantity, had to be re-crystallized. Finally, the mother liquor was evaporated to dryness, carefully powdered and heated until it became of a uniform blackish-brown color; then cooled, dissolved in distilled water, and the clear, now colorless filtrate, boiled with nitric acid to decompose the nitrite into which the silver salt had been partially converted, and the silver nitrate was then crystallized as before, or, more frequently, was converted into

Fused Silver Nitrate, in the form of small cones; in fact, most of the silver nitrate was so converted; this operation being performed on the general work table (*T*) over a gas flame. The silver nitrate was placed into a porcelain casserole with cover, carefully heated to fusion, and then as carefully poured into the moulds of silver—an operation which insured black fingers, and black stains on the face and wearing apparel of the operator notwithstanding all conceivable precaution to avoid them. Personally I have never

succeeded in avoiding silver-nitrate stains when working with that commodity, and I know of no one that has. Another salt that was made on this furnace in large quantities was

Mercuric Sulphate—this, of course, by the direct action of sulphuric acid on metallic mercury. The beautiful white salt produced was used exclusively for making

Corrosive Sublimate. The perfectly dry salt was intimately mixed with chlorid of sodium in molecular quantities and by means of an

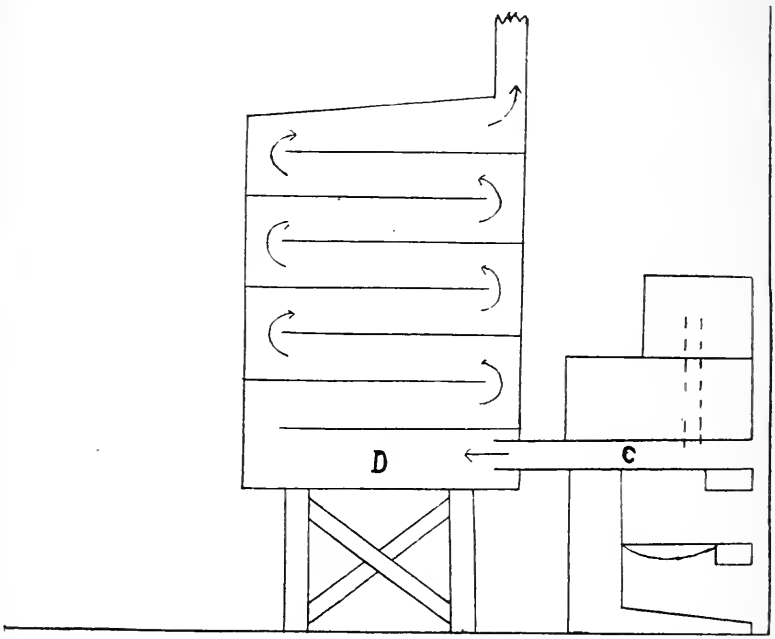


FIG. 4.—Diagram of Corrosive Sublimate Apparatus.

iron spoon conveyed in small portions at the time into the subliming or vaporizing tube (*C*) previously and continuously heated at a proper temperature by the fire beneath. Here the interchange of elementary constituents took place, mercuric chloride vapor passed into the condensing chamber (*D*), where it had to traverse a series of shelves with openings at alternate ends in the direction of the arrows (shown in detail by *Fig. 4*), and was so perfectly condensed, in the form of fine powder, during its passage towards the flue, that it was practically all deposited on the shelves without appreciable

loss. From time to time the sodium sulphate accumulating in the subliming tube was scraped out with the feeding spoon. The novel idea of carrying the sublimate vapor into a chamber and condensing it in fine powder form, instead of subliming it in crystalline masses, as is and has been the practice of manufacturers, was conceived by Professor Maisch in consequence of the demand of the Medical Purveyor for large quantities of powdered corrosive sublimate and the danger incurred by the operator during the ordinary process of reducing the crystalline salt to powder. The one doubt that presented itself to our minds was the failure of a sufficient draught to prevent the

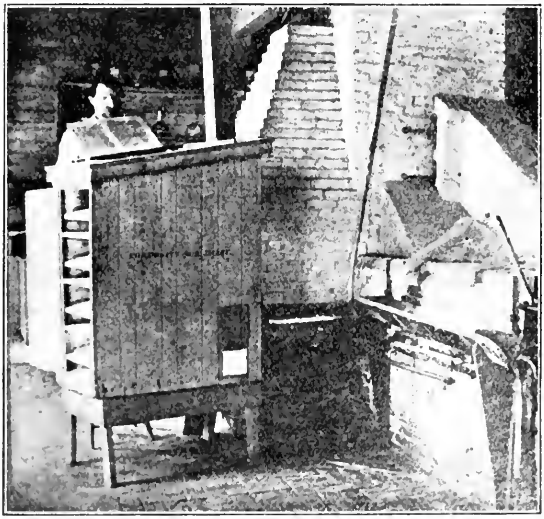


FIG. 5.—Subliming Chamber for Corrosive Sublimate.

leakage of the vapor through the joints formed by the sliding doors of the chamber, well shown in the half-tone picture (*Fig. 5*), on the one hand, or the possible loss by excess of draught, which might carry much of the mercurial vapor into the chimney, on the other. But both of these points were definitely and favorably settled after the first few trials. The draught being inward, no corrosive sublimate vapor escaped into the laboratory; and the distance traversed by the vapor insured its practically complete condensation before it reached the exit into the flue. It is safe to say, that this idea has given the incentive to other applications of a principle which had previous to this time been applied probably only to the sublimation

of sulphur—for example, to the vaporization of camphor into large chambers and its condensation in powdery form by partitions forcing its passage in alternate directions.

Next to the corrosive sublimate tube and furnace were two deep sand baths for the reception of large (6½ to 7 gallons) tubulated glass retorts (*E*) which were almost continuously in use for the distillation of

Heavy Oil of Wine (*Oleum Aethereum*). This arrangement is shown in detail by *Fig. 6* and requires little explanation. The retorts were of such size as to leave but a small space for sand between them and the interior sides of the sand bath, the thin-walled iron sand bath being so fitted into the furnace walls that the flues

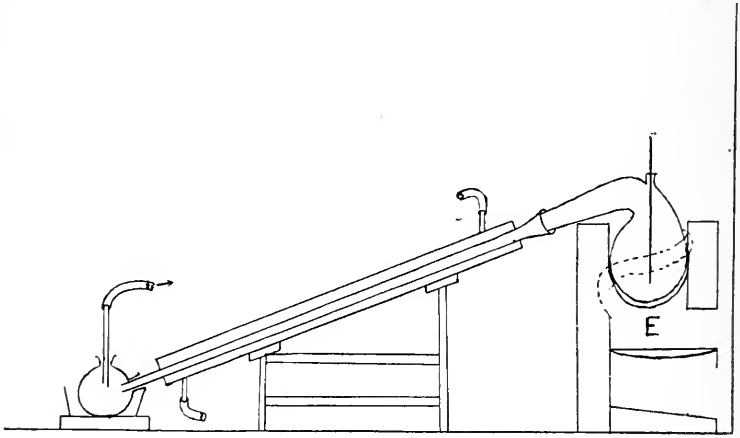


FIG. 6.—Apparatus for Distilling Heavy Oil of Wine.

from the fire bed made a complete spiral circuit before entering the stack. This had for the purpose the expeditious control of the heat, the closing of the draught door and opening of the fire door admitting cold air through the latter, thus quickly lowering the temperature, while the closing of the fire door and the opening of the draught door caused an equally rapid increase of the temperature—the fuel in this, as in all other furnace operations, being anthracite coal. The necessity of this control was due to the fact that the successful production of heavy oil of wine depends on maintaining the right temperature, which lies within narrow limits. If below 150° C. (302° F.) the reaction slackens and fails almost completely in producing heavy oil of wine, other undesirable products

being formed instead; on the other hand, if it rises above 160° C. (320° F.) the contents of the retort are not only liable, but will almost inevitably froth over, and the material becomes an absolute loss. The best results were obtained if the temperature did not vary much, one way or the other, from 155·5° C. (312° F.) The distillation of heavy oil of wine being a practically daily task, at least for a long period, the first duty in the morning, and the last in the evening, was connected with it. The retorts, if not cleaned the evening before, for which frequently there was no time, were emptied and carefully cleaned, so as not to leave as much as a speck of the carbonaceous product of decomposition, which sometimes encrusts parts of the inner walls, in them; for it was found that the presence of such was very likely to cause the frothing over of the contents during the distillation. Having then been thoroughly rinsed and drained, and dried on the outside, they were placed on a thin layer of sand in the sand bath, and filled through the tubulure with the previously prepared mixture of strong alcohol and concentrated sulphuric acid to within an inch of the neck. Sand was then poured into the bath, reaching to about three-fourths the height of the body of the retort, the thermometer inserted into the tubulure, the connection made with the condenser, this with the tubulated receiver, and the latter with a tube leading into the chimney flue, by means of a rubber tube attached to a glass tube extending from the tubulure. All these connections were carefully wrapped with moist bladder, to secure them from leakage; for during the reaction there is an abundance of sulphurous acid developed, the inhalation of which must be avoided, not to speak of loss of product by escape from improperly secured connections. A glance at *Fig. 6* will show this arrangement better than can be done by description. Heat was now applied so that the temperature might rise as rapidly as possible to 155°, and then constant vigilance was necessary to maintain this temperature as near as possible, by the expedients previously mentioned. This is illustrated in the half-tone illustration (*Fig. 7*) in which the operator is evidently engaged in examining the thermometric indication. During the progress of this distillation a small quantity of liquid will collect in the receiver before there is any ebullition; then, when the proper temperature is reached, the contents will simmer gently; presently little black, frothy bubbles will make their appearance, and soon the entire sur-

face will be covered with a black froth, which increases in density and thickness until the operation is finished, this being indicated by the paucity of distillate dripping from the condensing tube into the receiver. The fire is then withdrawn, the fire door remaining open and the draught door closed, so that the sand bath and retort may cool rapidly. The receiver is disconnected, its contents, which sometimes are in two layers, but mostly in one homogeneous layer, are transferred to an open dish, loosely covered with paper, and allowed to remain for spontaneous evaporation over night. On the

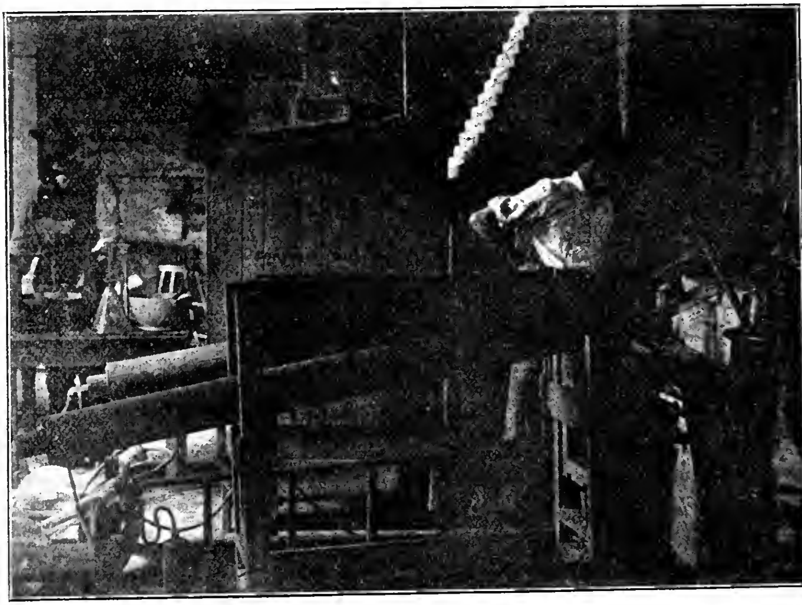


FIG. 7.—Distillation of Heavy Oil of Wine.

following morning, this distillate, now reduced to a few ounces, is found in two layers—the lower is heavy oil of wine, the upper one mainly water, retaining a little sulphurous acid. The oil of wine, after washing with a little water, is then ready for use, and was usually at once converted into compound spirit of ether, of which large quantities were constantly in requisition. If the process was successful, the yield from 6½ gallons of the mixture, consisting of equal volumes of alcohol and acid, was from 6 to 7 ounces of heavy oil of wine, while a solid crust of the carbonaceous frothy matter,

often two inches deep, remained on the surface of the acid liquid residue in the retort. If by any chance this solid crust was ruptured during the distillation, or if it failed to form, the contents of the retort invariably frothed over at some period during the 8 or 10 hours which, on an average, were consumed in the distillation.

The furnace in the rear of the stack enclosed a large kettle (*F*) which was used mainly for preparing solutions of saline compounds of various descriptions, such as liquor potassæ, the carbonates of soda and potash, etc., which in turn were used for a variety of purposes; the sodium carbonate for making

Solution of Chlorinated Soda, by admixture with solution of chlorinated lime in the huge tank or tub, capable of holding several hundred gallons, indicated by (*O*) in the northeast corner of the room, while the

Potassium Carbonate was purified by filtering the solution and evaporating it to dryness in shallow vessels on one of the furnace openings indicated by (*G*) on the western side of the stack. These openings were also provided with sand baths, on which, in shallow porcelain lined vessels, solution of

Potassium Acetate, previously prepared in stone-ware jars, was evaporated to dryness, and then, while still hot, filled into wide-mouthed, well-dried bottles, and immediately corked. A number of large wooden tubs, of 100 gallon capacity, indicated by (*n, n, n*,) were used mainly for the purpose of precipitating ferric hydroxide, this in turn being used for making

Citrate of Iron, most of this being converted into

Citrate of Iron and Quinine, of which immense quantities were in constant requisition. These solutions, after proper concentration, were transferred in earthen-ware jars to the scaling room, situated on the third floor of the main building, where a man was continuously employed in painting them on the surface of panes of glass, from which, after drying in a hot closet, they were removed in form of scales by simply tapping the glass edgewise on the surface of the work table, aided, under *unfavorable* conditions, by scraping with a spatula. The

Solution of Ferric Sulphate required for precipating the ferric hydroxide was prepared in large enameled kettles on the furnace under a shed on the outside of the building, indicated by (*K*), this obviating the necessity of a fume chamber during the process of

oxidizing the ferrous sulphate solution with nitric acid. On this furnace

Monsel's Solution (Ferric Sulphate) was also prepared in large quantities, while

Solution of Ferric Chloride was oxidized on this furnace by the action of nitric acid on a solution of ferrous chloride, prepared by the direct action of hydrochloric acid on metallic iron (card teeth) and acidulated after filtration with the required amount of HCl.

Syrup of Squill was another preparation made on this furnace, mainly because of the facility offered by the crane (*L*) in placing the large enameled kettles used for boiling the syrup on the fire and again removing them. The last furnace to mention is that on the interior in the southeast corner of the room, indicated by (*H*). This was used for minor operations, such as making permanganate of potash, benzoic acid from benzoin by sublimation, etc., neither of which were prepared in appreciable quantities. Aside from occasional crucible operations, the kettles and sand baths being removable, these furnaces were used principally for boiling lead plaster. Finally

Gun Cotton was not the least important of the products turned out in the Furnace Room, notwithstanding, or possibly because of, its inflammable nature. This was made in large stone-ware jars, by the process then given in the U.S.P., which directed the immersion of the cotton in a mixture of nitrate of potash and sulphuric acid for twenty-four hours, at a certain temperature. I soon found, however, that operating in pound quantities was a very different problem from operating with ounces, that the prescribed temperature was probably within proper limits in pharmacopœial quantities, but totally beyond control when applied on a manufacturing scale. While engaged in the laboratory of the Messrs. Wyeth, I had an experience which served me a good purpose here. I had frequently prepared

Citrine Ointment, which at that time was directed to be made by the direct action of acid solution of mercuric nitrate on neatsfoot oil, with good success, obtaining a golden yellow ointment. Being required to make a quantity of 50 pounds or more, the whole quantity was started according to the official directions, the neatsfoot oil being brought to the required temperature. After the addition of the acid nitrate, reaction of course set in promptly; but it failed to

subside, became more violent from moment to moment, the mass began to froth, and continued to froth. A portion was removed into another vessel; it still frothed, and after filling several vessels (with bubbling froth), it finally subsided to form a dark brown unctuous mass, from which much of the mercury had separated in a metallic state—in short, a ruined ointment. I had learned my lesson, that mass has much to do with reaction; that a temperature suitable for small quantities had to be controlled by proper means when large quantities were taken in operation. It was so with gun cotton, but it manifested itself differently. It was found that after the cotton had been thoroughly imbued with the acid mixture, the conversion into soluble gun cotton was far more rapid than was indicated by the pharmacopœial directions—this being doubtless due to the temperature generated during the reaction. If this action was permitted to continue, the soluble cotton became gradually converted into the less soluble and more explosive variety and, therefore, it was necessary to intercept the process at a point when conversion into soluble gun cotton was complete. The solution of this problem was quite simple. It consisted in removing a small pledget of the cotton from time to time, washing it quickly in water, immersing it twice in fresh portions of alcohol, expressing, and immediately shaking it in a test tube with a mixture of one volume of alcohol and three of ether. So long as the sample did not dissolve in this mixture, the action of the acid on the cotton was allowed to continue; but as soon as it dissolved perfectly and quickly in the ether-alcohol mixture, the reaction was intercepted by throwing the acid mass into a large quantity of water, then washing and treating it in the usual manner.

In the foregoing I have about outlined the work in which I was directly concerned. In order to round up, however, it may be of interest to mention that the entire second and third floors of the main building were occupied almost exclusively for bottling, labeling and wrapping the medicaments manufactured in the different departments; in the manufacture of roller bandages, the spreading of isinglass plaster, the rolling out of pills, and like operations, by a force of probably 150 women and girls, under the superintendence of Miss Maggie Davis. From here they were turned into the packing rooms, where they were boxed, transferred to the warehouse—

a large building situated on the northwest corner of Sixth and Master Streets—from whence they were delivered on the requisition of the Medical Purveyor. The spacious upper floors of this warehouse, extending through to Marshall Street, were used in the manufacture of sheets, pillow slips, and other similar hospital requisites, in which several hundred women and girls were engaged constantly to the end of the war.

In closing, I venture to express the hope that this necessarily imperfect account may prove of general interest, and particularly a welcome reminder to those who participated in the stirring events of the Civil War.

PROGRESS IN PHARMACY.

A QUARTERLY REVIEW OF SOME OF THE MORE IMPORTANT ADVANCES IN PHARMACY AND MATERIA MEDICA.

By M. I. Wilbert,
Apothecary at the German Hospital, Philadelphia.

The Food and Drugs Act, June 30, 1906, as the recently enacted pure food and drug law is now officially designated, still remains the favorite topic for discussion with all persons directly interested in the manufacture and sale of drugs and medicinal preparations.

The rules and regulations that have been adopted as a guide, in the proposed enforcement of the food and drugs act, have been published as Circular No. 21, by the United States Department of Agriculture, and may be obtained free, by any one interested, from the Secretary of Agriculture or from the Chief of the Bureau of Chemistry.

The far-reaching nature of the regulations that have been adopted is well illustrated by the definitions that are included in Regulation 28, concerning substances named in drugs and foods.

The term alcohol is defined to mean common or ethyl alcohol, either as "Cologne spirits, grain alcohol, rectified spirits, spirits or spirits of wine." As derivative of alcohol we have "aldehyde, ether, ethyl acetate, ethyl nitrite, and paraldehyde." Preparations containing alcohol are defined as not alone including galenical preparations but also brandies, whiskies and wines.

Among the morphine derivatives we find apomorphine, dionine,

peronine, and the salts of morphine; heroin, it will be remembered, is specifically mentioned in the act itself.

Among the preparations of cocaine we find a definition that will no doubt be objected to by some manufacturers. Coca leaves, and hence preparations made from coca leaves, are defined as being preparations containing cocaine or salts of cocaine.

Among the derivatives of chloral hydrate we find enumerated "chloral alcoholate, chloralamide, chloralimide, chloralose, dormiol, hypnal and uraline."

Under acetanilide we find, among a number of more direct derivatives, "citrophen, lactophenin and phenacetine."

The forty regulations that are embodied in the pages of Circular 21 are well worth the careful attention of pharmacists. Taken as a whole they have met with favorable reception by manufacturers and large dealers, and it is generally expected that by January 1st, the date when the law is to come in force, provisions will have been made for a general acceptation of the spirit as well as the letter of the law.

The blanket guaranty, permitted under Regulation 9, has been filed, by a number of manufacturers, and pharmacists will do well to arrange their dealing in accordance with the provisions of this regulation.

Denatured Alcohol.—Regulations No. 30. United States Internal Revenue. This is the title of a pamphlet comprising sixty pages descriptive of the regulations and instructions concerning denatured alcohol.

The production as well as the sale of this article appear to have been elaborately safeguarded. The denaturing of alcohol is to be done in bonded warehouses used for denaturing alcohol, and for no other purpose.

The sale of the product is limited to persons who secure the necessary permit from the Collector of Internal Revenue of the district in which the business is to be carried on. Dealers themselves are to be classed as wholesale dealers; selling the original stamped package, and retail dealers who may sell or offer for sale quantities of less than 5 gallons.

The product that will be for sale in the ordinary course of trade is that designed in the regulations as completely denatured alcohol. This consists of 100 parts by volume of ethyl alcohol of the required

proof, 10 parts by volume of methyl alcohol and 1 part of approved benzine.

Provision is also made for the use of specially denatured alcohol by certain manufacturers, not, however, by those engaged in the manufacture of liquid medicines or beverages.

N.A.R.D. Convention.—The annual convention of the National Association of Retail Druggists was held in Atlanta, Ga., October 1 to 5, 1906. The attendance at the meeting is said to have been unusually large and the interest in the proceedings keen, despite the fact that little but routine work was accomplished.

The report of the Committee on Resolutions, embodying as it does a review of the accomplishment as well as the prospective policy of the association, includes a large number of resolutions on widely varied subjects. Among the more prominent of these resolutions were expressions of opinion on the marketing of proprietary remedies, the endorsement of the so-called D.C.S.N. plan and recommendations to popularize U.S.P. and N.F. preparations with physicians.

The establishment of a National Buying Club was discountenanced and the general policy of local buying clubs ignored, as not coming under the jurisdiction of the National Association. The failure to secure the enactment of the Mann Bill was discussed at some length and the committee having the matter in charge were instructed to draft a bill that would obviate the shortcomings of this bill and still secure relief from the present abuses in connection with patents on medicinal substances.

N.W.D.A. Meeting.—The National Wholesale Druggists Association met in annual convention in the city of Washington, October 8 to 11, 1906. The members in attendance were more than usually interested in the reports of committees and in the discussion of trade subjects. Not the least interesting of the several subjects presented was the consideration of the recently enacted pure food and drug law.

From the available reports of the proceedings of the convention it would appear that the members present were generally favorable to the enforcement of this law, within reasonable limitations, and were willing to do all in their power to comply with its requirements.

The Pharmacopœia of the United States of America was discussed at some length and a special committee was appointed to secure

facts and data relating to shortcomings and impracticable requirements in this book and to report to the chairman of the Pharmacopœial Revision Committee requesting that the necessary changes be made at the earliest possible date.

Public Health Defence League.—This is the name that was tentatively adopted by the delegates who were present at a conference, to devise ways and means to protect the public health and morals, held in the Hudson Theatre, New York, on November 15, 1906. The Conference was held under the auspices of the Medical Society of the County of New York and was attended by upwards of three hundred delegates and persons otherwise interested.

The immediate object of the Conference was the formation of a national organization to obtain and to disseminate accurate information concerning practices and conditions that are dangerous to public health and morals and to combat these practices and abuses by the education and enlightenment of the public, the enactment of needed laws and by the temperate enforcement of existing laws and statutes.

The delegates present adopted a set of resolutions adopting or endorsing a proposed charter and continuing the Conference committee to effect a permanent organization.

German Naturalists and Physicians.—The seventy-eighth annual meeting of this organization was held this year in Stuttgart, from the 16th to the 22d of September. The Section for Pharmacy and Pharmacognosy of this association bears to pharmacy in Germany relatively the same position that the Section on Scientific Papers of the American Pharmaceutical Association does to pharmacy in our own country. The papers presented to this section this year were numerous but dealt largely with subjects of but secondary importance to the active pharmacist. In commenting on the nature of the communications that were presented this year the German pharmaceutical journals generally have deplored the ultrascientific character of these communications and the general lack of practical information more directly useful to the busy pharmacist in his every-day work.

Perkin Jubilee in America.—The celebration of the fiftieth anniversary of the discovery of the first aniline color, by Sir William Henry Perkin, which was held in London, in July, has been supplemented by a corresponding celebration in New York City, at which Sir William Henry Perkin was the guest of honor. One of the chief

features of this celebration was a dinner, on the evening of October 6th, presided over by Prof. Charles F. Chandler, at which upwards of 400 chemists and teachers were present.

Proprietary Remedies in Austria.—The pharmacists in Vienna, according to the *Pharmaceutische Post*, page 514, 1906, are taking an active interest in combating the popularization of proprietary remedies, that are being exploited there at the present time, by offering a line of desirable substitutes made by the pharmacists themselves.

The formulæ for these preparations were devised by a local commission of pharmacists and an effort is now being made to interest other of the Austrian pharmaceutical societies in the plan.

Among the arguments that are being used to physicians to favor the new preparations is that they would be more economical to the patient, would prevent self-medication, and would avoid misleading advertising of other preparations direct to the public.

It is also pointed out how physicians could more readily control the purity and the composition of these open formula remedies, and, further, knowing the exact composition of the remedies, how they could be modified in appearance and taste to suit the idiosyncrasy of individual patients and thus retain their confidence and respect. Another feature of the same work that has been taken up by Austrian pharmacists is to point out to physicians how much more desirable it would be to have active medicaments dispensed in capsules or in cachets in preference to prescribing the commercial compressed tablets the activity of which is at best problematical.

German Pharmacopœia.—A new edition of the German Pharmacopœia is in course of preparation and invitations have been extended, by the commission having the revision in charge, for additions and corrections.

From the suggestions that have been made it would appear that there is little or no desire to have the style of the German Pharmacopœia changed in any way. There appears, however, to be a rather widespread feeling that the book should include official descriptions of a greater number of newer remedies.

A Proposed Imperial Pharmacopœia.—Donald McAllister, M.D., at the meeting of the British Medical Association, in Toronto, in 1906, in speaking of the lack of harmony in the various national pharmacopœias, suggested that the British Pharmacopœia should be broadened in scope so as to be adapted to the needs of all of the

nations included in the British Dominions. He invited discussion on the proposal with a view of developing the present British Pharmacopœia into a generally acceptable Imperial Standard.

Alkaloids of Calumba Root.—Calumba root contains at least two bases allied to, but differing from berberine, which, as Gordin has pointed out, does not occur in this drug. Like berberine these bases are quaternary yellow alkaloids which are readily reducible to colorless tertiary hydro-compounds. One of these bases, Calumbamine, has been separated as a crystalline iodide. (*Phar. Jour.*, Sept., 1906, page 283.)

Aspirophen.—This is said to be amido-acet-paraphenetidin acetyl salicylate and is obtained by combining molecular quantities of acetyl salicylic acid and amido-phenacetin. The resulting compound is readily soluble in hot water but only sparingly soluble in water at ordinary temperatures. (*Phar. Zeit.*, 1906, page 808.)

Bactericidal Action of Silver Compounds.—C. R. Marshall and E. F. Macleod Neave, at the request of the Therapeutic Committee of the British Medical Association, made a comparative test of the various silver compounds in common use.

The percentage of silver in the several compounds was determined and subsequently solutions were made to contain definite proportions of silver. The experiments showed that so far as bactericidal action was concerned the several silver compounds investigated fall into one of three groups:

(1) Powerfully bactericidal.

(2) Slightly bactericidal.

(3) Practically inert.

The first group includes the greater majority of well-known silver salts such as the nitrate, fluoride, citrate, lactate and a number of the organic compounds, such as casein silver, albargin, protargol, largin and novargan.

The second group contains but one preparation, nargol.

The third, or practically inert group, contains two—collargol and argyrol. (*Phar. Jour.*, Aug. 25, 1906, page 237.)

Citrocoll.—This is said to be neutral amido-phenacetin citrate. It is readily soluble in water and occurs as a white crystalline powder melting at 193° C. It has been recommended as an antipyretic, antirheumatic and a nervine. (*Phar. Zeit.*, 1906, page 865.)

Formurol.—Formurol is a trade name for hexamethylentetramin

sodium citrate, a white crystalline powder that is readily soluble in water and has a pleasant and agreeable taste. It is to be used in cases of gout and inflammatory conditions of the kidneys and urinary tract. Dose, 1 gramme two to five times a day. (*Phar. Centralh.*, 1906, page 777.)

Preservation of Hydrogen Peroxide by sodium or calcium chloride. Medicinal solutions of hydrogen peroxide are said to be preserved much longer by the addition of 1 per cent. of sodium or of calcium chloride than when the usual preservatives, inorganic acids, are employed. (*Phar. Jour.*, Sept. 1, 1906, page 263.)

Purgative Principles of Chinese Rhubarb.—According to E. Gilson (*Arch. de Phar. et de Therap.*), the purgative principles of Chinese rhubarb are glucosides which do not occur in the root as a mixture, but in the form of a kind of compound, which he names rheopurgarin.

This compound glucoside consists of chrysophanein, rheocrysin, emodin glucoside and rhein glucoside. Rheopurgarin is soluble in strong solutions of organic acids, which accounts for the prevailing opinion that the purgative principle is soluble in water. Chrysophanein has been isolated in a state of purity, and from it a new form of chrysophanic acid has been obtained. Rheocrysin is a new glucoside which is hydrolysed into dextrose and rheocrysidin. (*Phar. Jour.*, Sept., page 263.)

Purgier Konfect.—This is another one of numerous trade names that have been applied to preparations of phenolpthalein, to be used as a laxative. Among the now numerous names that have been applied to phenolpthalein or dihydroxypthalophenon and to preparations containing it, are parapthalein, purgen, purgo, purglets, purgella, purgolade, purgylum, probilin and laxirconfect. All of this, too, before the substance has appealed to the inventive faculties of the numerous manufacturers of proprietary specialties in our own country.

Quinine Acetyl Salicylate.—This is said to be a basic combination of these two substances and was obtained by L. Santi by dissolving, each, 378 grammes of quinine and 1,809 grammes of acetyl salicylic acid, in ether, and mixing the two solutions. The resulting white crystalline powder has an intensely bitter taste, melts at 157° and is soluble in 1,000 parts of water and in about 30 parts of alcohol.

Attempts to produce the neutral acetyl salicylate of quinine were not successful.

The basic salt may be given in doses of 0.4 grammes. (*Phar. Centralh.*, 1906, page 831, from *Bollet. Chim. Farm.*)

Somnos.—A series of experiments on the physiologic action of somnos, in comparison with a 5 per cent. solution of hydrated chloral, published in the *Journal of the American Medical Association* (Sept. 15, 1906, page 872), lead to the conclusion that somnos, which is a solution of trichlorethidene propenyl ether, or chloral glycerinate, is practically indistinguishable, in its pharmacologic action, from a 5 per cent. solution of hydrated chloral.

The urine of rabbits which had been given somnos contained a levorotatory compound which reduced Fehling's solution readily. This substance is probably urochloralic acid, the same substance as is found in the urine after the administration of hydrated chloral.

An interesting reference to the history of the chloral compounds may be found in Bulletin No. 1 of the *American Pharmacologic Society*, and republished in *American Medicine*, for October, 1906, page 432. This reference says that the reaction of glycerin on chloral was studied qualitatively at least, as early as 1874. "Louis Henry, of Louvain, Belgium, in an article published in *Berichte der Deutschen Chemischen Gesellschaft*, VII (1874), page 764, states as follows with regard to chloral addition compounds: 'Chloral unites with energy with water and with alcohol to form compounds of the general types

$$CCl_3CH\begin{matrix} \diagup OX \\ \diagdown OH \end{matrix}$$

in which X is a positive radical derived from a monatomic or polyatomic alcohol or an alcohol acid.' Henry says, in addition, 'I have established this fact with a large number of alcohol compounds, which by their nature and function were very different, as, for instance, with the polyatomic alcohols such as glycol, glycerin, the basic ethers such as ethylene chlorhydrin, glycerin dichlorhydrin, etc.,' and concludes: 'I believe that chloral can be considered to be a kind of reagent for all bodies with alcoholic nature.'"

Sophol.—This is said to be a combination of formic aldehyde, nuclein and silver and to contain 22 per cent. of metallic silver. It is soluble in water and is recommended as a substitute for other

organic preparations of silver. (*Chemist and Druggist*, Sept., 1906, page 462.)

The Formation of Cocaine in Coca Leaves, according to the investigation of K. de Tong, occurs mainly in young leaves. With the increase in the size and age of the leaf the alkaloid content decreases but is not totally absent even in dead leaves. (*Phar. Zeit.*, Sept., 1906, page 795.)

To Purify Drinking Water.—M. Lambert proposes to add 0.06 grammes of potassium permanganate to each liter of water. This should be left standing for ten minutes and then 0.10 of manganous sulphate added. The resulting mixture is then allowed to precipitate and the supernatant clear liquid decanted off. (*Chemist and Druggist*, Sept., page 389.)

Tulase.—This is the name that has been given by Professor Behring to his immunizing and curative serum for tuberculosis. This serum is now being furnished in an experimental way, for practical trial. (*Chemist and Druggist*, Sept., 1906, page 422.)

Tyree's Antiseptic Powder.—The report of a sub-committee of the Council on Pharmacy and Chemistry of the American Medical Association (*Jour. A.M.A.*, Oct. 20, 1906, page 1316) calls attention to the fact that while this preparation is advertised as being a mixture of sodium borate, and alum with phenol, thymol, glycerin, menthol, oil of eucalyptus and oil of gaultheria, it is, in reality, composed of approximately 15.5 per cent. of anhydrous zinc sulfate, 81.2 per cent. of boric acid and 0.5 per cent. of volatile matter consisting of a mixture of odorous materials sufficient to give the mixture its distinctive, characteristic odor.

SOLUTION OF HYDROGEN PEROXIDE CONTAINING ACETANILIDE.

By Charles H. LaWall.

The writer was recently very much surprised by having his attention called to several samples of hydrogen peroxide solution from different sources, all of which had a strong odor resembling nitrobenzol. Upon obtaining a sufficient quantity and shaking it out with ether, evaporating the solvent carefully and testing the residue

for nitrobenzol by reducing and testing for aniline, positive results were obtained.

Correspondence with the firms making the article in question revealed the interesting fact that the reaction which had been entirely ascribed to the presence of nitrobenzol, was due, in part at least, to the presence of acetanilide which had been used as a preservative agent in preventing the deterioration of the solution with the accompanying loss of oxygen.

Further investigation of the facts in the case showed that the practice was confined to a few manufacturers who had regarded it in the light of a trade secret until the approach of the period of the enforcement of the regulations of the Food and Drugs Act, which requires the labeling of all products containing acetanilide, made this condition no longer possible.

That the presence of small quantities of acetanilide does preserve the solution from decomposition was shown by the fact that several samples examined which were known to be at least four months old showed from 9.5 to 10.5 volumes of oxygen. These had originally been supposed to contain 10 volumes.

There would probably be no objection to the use of small quantities of acetanilide when the advantages of increased stability are considered, but the product should be labeled, as it will have to be after January 1, 1907, with the amount of the preservative stated on the label.

The most interesting fact in connection with the investigation of the subject is the production of the nitrobenzol-like odor referred to in the first part of this article. It requires about four months for the development of this odor, which is very pronounced and very characteristic.

The presence of acetanilide in the freshly made and odorless product can be detected by shaking out about 25 c.c. of the solution with a few cubic centimeters of chloroform, evaporating the latter to dryness and applying the isonitrile-test for the presence of acetanilide.

THE NEEDS OF THE COUNCIL.[1]

By W. A. Puckner, Chicago,
Secretary of the Council on Pharmacy and Chemistry of the American Medical Association.

In taking up the discussion of "The Needs of the Council," I take it for granted that you are perfectly familiar with the conditions which led to the establishment of this advisory body, the Council on Pharmacy and Chemistry, by the American Medical Association, also that you are familiar with its function to furnish physicians with reliable information in regard to the newer and proprietary remedies, and with the advantages to be derived from the work of the Council by all those interested in honest medicine and pharmacy and in the well-being and health of the people.

The work of the Council may well be divided into two parts: First, that of securing information in regard to the nature, composition and value of medicine; and, second, the dissemination of this information. Especially in the first task are pharmacists in a position to give valuable aid to the Council.

Pharmacists have long been familiar with the various phases of the deceit and fraud practised in misleading or deceiving the medical profession, to the detriment of both patient and physician. While many instances are on record where the retail pharmacist has given publicity to flagrant cases of deception, in general he has done but little to check these practices, or, worse, has adopted them as his own to some extent. This is, perhaps, best illustrated by the very common practice of selling household remedies, the so-called "non-secrets," under a "pseudo firm-name;" a practice firmly established and so generally adopted that the wrong connected with it has been lost sight of. For wrong this practice is, since its only object is to hide the real origin of the article—to deceive the purchaser.

However, the pharmacist is not to be blamed for the conditions which prevail. As a rule he fought for legitimate pharmacy and only after he realized that his efforts were wasted, while those of the nostrum promoter appeared to receive the endorsement of physicians and the public, did he, in self-defence, adopt the methods of the latter.

As just stated, there are many instances on record where pharmacists have called attention to flagrant cases of deception, through

---

[1] Read before the Philadelphia Branch of the American Pharmaceutical Association, November, 1906.

publication in pharmaceutical journals and by papers presented to pharmaceutical societies. But much, if not all of this, was of little avail because of the limited publicity given it and by its failing, in many instances, to reach the class of persons primarily to be benefited, the physicians. There is even a feeling among pharmacists and chemists that it is beneath their dignity, or at least not to their credit, to aid in the exposure of frauds. I have before me now an offer by an eminent chemist to assist the Council in verifying the claims made for a proprietary article, who stipulates: "Would like to make it a condition of our doing this work that the matter end with our report to you." At the recent meeting of the American Pharmaceutical Association chemical analyses of effervescing salts were submitted showing that many were not true to their claimed composition. But while the result of the analyses could not be questioned, yet the analyst refers to them by number. Had names been mentioned the paper would probably not have been received by the Association. All this, because exposure of such dishonesty is not considered to be commendable work. Therefore, to "avoid trouble," associations and individuals hesitate to make public the truth and, by this, aid and foster the many fraudulent medicines offered for sale.

However, just as the public has become aware of the extent to which food adulteration has been carried and now demands to know the truth, so it is with medicine. The medical profession has come to realize that very many medicines on the market are not what it was led to believe them to be and that some are rank frauds. And now the truth is demanded. And just as the daily press no longer dares withhold the truth in regard to any product because its promoter occupies space in its advertising column, so the time is near when the editors of medical journals will no longer find it profitable to conduct their journals to the interest of their advertising patrons and in entire disregard to the best interest of their subscribers.

That failure to publish derogatory as well as commendatory reports of proprietary remedies is rapidly becoming obsolete is shown by the publication of analysis of acetanilid mixtures[1] and the report on organic silver salts[2] in a recent issue of the *British Medical*

---

[1] *Br. Med. J.*, 1906, Vol. II, p. 27.

[2] *Br. Med. J.*, 1906, Vol. II, p. 359.

Journal; by the reports of the examination of proprietary remedies carried out under the auspices and financial support of the Deutscher Apothekerverein and published in the *Apotheker Zeitung;* and by the publication in the *Druggists Circular*, and in other pharmaceutical journals, of reports of work done along these same lines. Similarly the Council on Pharmacy and Chemistry is now publishing in the *Journal of the American Medical Association* the result of its work.

Upon organization the Council adopted a set of rules for its guidance. (See page 500 of this JOURNAL.) Since the adoption of these rules a considerable number of proprietary articles have been considered. Descriptions of those articles which appeared to comply with these rules are now being published in the *Journal.* Later these are to be published in book form. Concurrently with the publication of approved articles, the Council is also publishing reports on articles which are offered to the medical profession under false claims.

Lack of publicity of the work of the pharmacist in advising physicians in regard to the medicines offered to them will in the future, therefore, not deter from such investigation. While it is taken for granted that the pharmacist will avail himself of the opportunities offered to act as advisers and protectors of the medical profession, it may not be amiss to point out somewhat more specifically some of the ways in which the pharmacist may and should aid the cause.

Criticism and Corrections of Preliminary Publication.—To some extent the acceptance of the articles which are now appearing in preliminary publications in the *Journal* was based on investigations made by or under direction of the Council, but it was largely based on evidence supplied by the manufacturer or his agent, or on statements taken from standard works of reference. It is, therefore, to be expected that statements will appear which are not in accord with the facts and that some articles have been accepted which do not comply with the rules. Also, some articles, acceptable at the present time, will be changed in composition or in the manner of their exploitation so as no longer to meet the requirements, and they should, of course, be dropped from the list of approved articles. Close scrutiny of the preliminary publication is, therefore, invited. The attention of the Council should be called to any false or misleading statement contained therein. It is suggested that the claims, as regards composition of articles, be verified by pharmacists when opportunity offers. The tests of identity, purity and strength, when

given, should be subjected to verification. If none are given they should be worked out, at least for the definite chemical bodies, since their ready and safe recognition is often of the greatest importance. The incompatibilities of new remedies should be studied and the physician advised of undesirable combinations. Finally, the Council must depend very largely on the pharmacist for its knowledge of the continued compliance of approved articles with rules 3 and 4.

The Aid of the Pharmacist in the Further Work of the Council.—New remedies are constantly being produced. While the vast majority will present no advance over older well-tried medicines and will soon be "withdrawn from the market," some remedies of real merit will appear from time to time, and these deserve a fair trial by the physician. It is the function of the Council to supply the physician with reliable information in regard to the composition and properties of the newer medicines so that he may know which are deserving of a trial at his hands. Here, too, the pharmacist is in a position to materially aid the Council in supplying information about the many new preparations introduced. Being thoroughly familiar with drugs he is often in a position to unmask some of the old nostrums which are being constantly introduced under new and attractive names or to early recognize the objectionable character of remedies which to the physician will appeal as new and wonderful.

The Chemical Laboratory of the A.M.A.—To aid the Council on Pharmacy and Chemistry in its work the trustees of the A.M.A. authorized the establishment of a chemical laboratory. As one of the functions of this laboratory it is proposed to use the available clerical force to collect, arrange, and finally disseminate information bearing on authentic or reliable data regarding the composition of nostrums.

In the past there has been a disposition on the part of physicians and pharmacists to ignore the evil associated with the indiscriminate use of medicine. While perfectly familiar with the many frauds connected with the exploitation of so-called patent medicines, these conditions have been considered as a matter of course. While the harm often done was recognized, yet as a whole this class of remedies was considered beneath the notice of the physician and pharmacist. The frauds connected therewith were considered a "joke." I recall a conversation where the "Scotch Essence of Oat" outrage was referred to as "a joke on the public," because in the hope of experiencing

the effects of oats "as do horses" its consumers instead became addicted to the use of morphine. Truly a ghastly joke!

But, as with the adulteration of foods so with patent medicines, the public is beginning to realize the extent to which it has been duped. It rests with physicians and pharmacists to advise and instruct the public in regard to the household remedies and proprietary medicines which may be used with comparative safety, and to warn against those which are harmful or worthless. That the physician is cognizant of the duty before him is shown by the many inquiries in regard to the composition of nostrums. It is hoped that individual pharmacists, pharmaceutical associations and schools of pharmacy will take an active part in this work of the Council and will liberally assist the proposed bureau in obtaining reliable information as regards the composition of all nostrums, whether offered to physicians or to the public.

PHARMACEUTICAL MEETING OF THE PHILADELPHIA COLLEGE OF PHARMACY.

The second of the series of pharmaceutical meetings for the season of 1906–07 was held in the museum of the college on Tuesday afternoon, November 20th, with Mr. E. M. Boring, a member of the Board of Trustees of the college and a well-known pharmacist, in the chair.

The first item on the program was the report of the Committee on Shorter Hours and Sunday Closing. Mr. R. W. Cuthbert, chairmain of this committee of the college, reported as follows:

There has been no definite plan formulated by our committee to bring about shorter hours and Sunday closing, but I think the outlook is brighter than ever. Many men are giving the question thoughtful consideration and some are in favor of it who, at one time, looked at it with disapproval. I hope that the committees will continue to work for the cause and that other committees will be formed. The town is too large to work as a whole, so I would suggest that we work in sections. If we get the matter started the interest will grow, and ways that we don't think of now may open up for the prosecution of the work. We want the suggestions and help of all who are interested. I am deeply interested in the matter and will do all I can to bring about results.

The subject was discussed by a number of members present. Mr. Thomas H. Potts said that he thoroughly believed in agitating this

subject and thought that each individual must act for himself. He showed how he had acted independently of others in closing his store part of the time on Sunday and in closing earlier in the evenings and said that other pharmacists in his neighborhood were now doing the same thing. Mr. Warren H. Poley agreed with Mr. Potts and said he thought the subject is one more or less dependent upon the individual as well as a local one. Dr. Lowe said that he thought that more might be done in the matter of Sunday closing. Mr. Wilbert said that the subject was not only attracting attention in this country, but was being discussed in very many European countries, including Germany. Mr. Evan T. Ellis said that before he went out of business, in 1875, the druggists in his neighborhood entered into an agreement to have one store open each Sunday while the others remained closed. Professor Kraemer called attention to the strength of the movement in Philadelphia and said that a number of pharmacists who had declared positively that they could not afford to close their stores on Sunday were now leading movements in various sections of the city to secure a thorough co-operation among neighboring pharmacists. In view of the importance of the matter Professor Kraemer moved the continuance of the committee with power to name sub-committees in various sections and to report on the progress of the movement from time to time.

Prof. Charles H. LaWall read a paper on "Nitro-benzol in Hydrogen Peroxide." The paper was discussed by Professor Lowe and E. M. Boring. (See page 582.)

Mr. Edward Post presented a paper on "The Manufacture and Commerce of Corks," which will be printed in a subsequent issue of this JOURNAL. The paper was illustrated with a fine collection of corks and cork products, which was presented to the college. Mr. Poley moved a vote of thanks to Mr. Post for his interesting paper and to the Armstrong Cork Company for the collection of corks, which motion carried.

Mr. M. I. Wilbert presented a "Quarterly Review on the Progress in Pharmacy." (See page 574.)

Mr. E. M. Boring called attention to a questionable medical advertisement in one of the leading daily Philadelphia newspapers. Professor Kraemer also called attention to a two-column article giving prescriptions in one of the recent Sunday papers, and moved the appointment of a committee to consider the subject of medical adver-

tisements and medical advice in the daily newspapers and to report at a later meeting. Professor Kraemer then exhibited a specimen of licorice grown by the late Henry N. Rittenhouse, and presented the following books to the college:

The second edition of Prof. Rudolf Kobert's "Lehrbuch der Intoxicationen;" the second report of the "Wellcome Research Laboratories at the Gordon Memorial College, Khartoum;" and "Conference of London Chemists Association and Burroughs-Wellcome Company."

The following provisional program has been arranged for the Pharmaceutical Meeting on Tuesday evening, December 18th:

"The Systematic Management of a Retail Pharmacy." By Mr. Harry B. Mason, of Detroit.

"A Special Form of Check for Paying Bills." By Harry C. Blair, Ph.G.

"The Retort Courteous." By C. L. Bonta, P.D., A.M.

"A Simple System for Personal Accounts." By E. Fullerton Cook, P.D.

"The Possibilities of Professional Pharmacy." By William C. Wescott, Ph.G.

An exhibit will be made by the manufacturers of special devices for simplifying accounting, the keeping of records, etc.

FLORENCE YAPLE,
Secretary pro tem.

OBITUARY.

Albert E. Ebert, a life-long pharmacist and a prominent member of the American Pharmaceutical Association, died at St. Luke's Hospital, Chicago, where he was taken for an operation for appendicitis, on Tuesday, November 20th. Mr. Ebert was 66 years of age, having been born in Germany in 1840. The next year his parents came to this country, and in 1852 he was apprenticed in the drug business and graduated from the Philadelphia College of Pharmacy in 1864. In 1867 he received the degree of Doctor of Philosophy in Munich where he was the student of Liebig.

Mr. Ebert engaged in the drug business in Chicago in 1868, and was actively engaged as a retail pharmacist until the time of his death. He was much interested in the advancement of American pharmacy and occasionally wrote papers on practical subjects. One of the last of his original papers was on the subject of "The Manufacture of Deodorized Opium and Tincture," and was published in this JOURNAL in 1902. One of his earliest papers was on this same subject, published over thirty-five years ago.

INDEX[1]

TO VOLUME 78 OF THE AMERICAN JOURNAL OF PHARMACY.

AUTHORS.

Arny, H. V., and T. M. Pratt. Estimation of caseine 121
The inorganic chemicals of the U.S.P., VIII 10
Asher, Philip. Assay of opium and its preparations 262
Attfield, John. Letter from, on Procter Monument Fund 448

Beates, Henry, Jr. Remarks at the organization meeting of the Philadelphia Branch of the American Pharmaceutical Association 328
Beringer, George M. Acetone collodions 470

Campbell, Theodore. Practical experience with Sunday closing 518
Cheney, F. L. Extemporaneous sulphurous acid 333
Cliffe, W. L. Practical experience with Sunday closing 517
Coblentz, Virgil. Comments upon the U.S.P. inorganic chemicals . 303, 387
Cohen, Solomon Solis. Function of the true pharmacist 325
Conwell, Joseph A. Practical experience with Sunday closing 518
Cook, E. D. Practical experience with Sunday closing 522
Cook, E. Fullerton. Abstracts from theses on pharmaceutical subjects . . 417
and Charles H. LaWall. Liquor cresolis compositus 169
Cuthbert, R. W. Sunday closing and shorter hours 503

Diehl, C. Lewis. United States Army Laboratory 559

Eccles, R. G. Professor Wiley on food preservatives in North Dakota . 335
Ehman, J. W. Abstracts of theses on chemical subjects 333, 416
England, Joseph W. The mental necessity of an early closing movement, 505
Syrup of wild cherry, U.S.P., 1900 267
Tincture of nux vomica, U.S.P., 1900 527
Eshner, Augustus A. The interdependence of medicine and pharmacy . 236

Gabell, C. P. The protection that should be afforded the pharmacist by law 91
Gordin, H. M. The alkaloidal assays of the U.S.P., 1900 453
Some alkaloidal assays 458
with W. H. Harrison. Separation of morphine from its solution in glycerin 464

Harrison, W. H., and H. M. Gordin. Separation of morphine from its solution in glycerin 464
Holm, Theodore. The root structure of Spigelia marilandica, Phlox ovata and Ruellia ciliosa 553

Kraemer, Henry. The Procter memorial 420
The use of metallic copper for the purification of drinking water . . 140

LaWall, Charles H. The duty of the pharmacist to aid in the elimination of irregular practices 465

[1] Compiled by Florence Yaple.

LaWall, Charles H. Report of the Pennsylvania State Pharmaceutical Association meeting 365
solution of hydrogen peroxide containing acetanilide 582
and E. F. Cook. Liquor cresolis compositus 169
Leffmann, Henry. The U. S. Pharmacopœia from the point of view of the analyst and as a legal standard 77

Oldberg, Oscar. Education and legislation in pharmacy 472

Perrédès, P. E. F. London botanic gardens . 1, 68, 113, 172, 224, 270, 317, 353
Pratt, Joseph H. The "Home Sanatorium" treatment of consumption . 422
Pratt, T. M., and H. V. Arny. Estimation of caseine 121
Puckner, W. A. The needs of the Council 584

Redsecker, J. H. Practical experience with Sunday closing 523

Sadtler, Samuel P. The origin of fusel oil in spirits 40
Schimmel & Co. The essential oils of the United States Pharmacopœia . 253
Schimpf, Henry W. A critical review of the inorganic chemistry of the new United States Pharmacopœia 18
Searby, W. M. Notes on the new Pharmacopœia 203
Shearer, William R. Liquor chlori compositus 333
Slade, Henry B. Studies in plant mutation 311
Smith, F. A. Upsher. Prof. John Attfield 103
Steele, David M. Sunday rest as a religious institution 508
Stevens, A. B. Biographical sketch of Prof. A. Tschirch 38
Japanese lac (Ki-urushi) 53

Thrush, M. Clayton. The eighth decennial revision of the U. S. Pharmacopœia from a physician's standpoint 30
Thum, John K. The debasing influence of monotony 514
Toplis, William G. Elixir aromaticum 332
Pasting labels on tin 332

Weidemann, C. A. Practical experience with Sunday closing 516
Wilbert, M. I. Benjamin Franklin 214
Doses in the U.S.P. 87
Nascent silver iodide 54
Progress in pharmacy 129, 280, 428, 574
Resumé of criticisms of the U.S.P. 403
Wiley, H. W. The use of preservatives in food 153

SUBJECTS.

Abrastol, detection of 381
Acetanilid in bromo-seltzer 138
in hydrogen peroxide (LaWall) 582
Acetone collodions (Beringer) 470
Acetone in making oleoresins 412
Acid, acetic, diluted, examination of samples (Seidman) 417
boric 18, 388
detection and estimation of 351
examination of samples (Butler) 417
hydrobromic 388
hydrochloric 388
hydrocyanicum dilutum 18
propylbarbituric 439
phosphoric 388
stearic, melting point 415
sulphuric 387
sulphurous 20, 389
extemporaneous (Cheney) 333

Aconite, discrepancy in dose of preparations 409
Adulterations, report of committee of Pennsylvania Association 368
Advertising, effective method for retail pharmacists 386
Albumin, artificial 138
Alcho 183
Alcohol, denatured (Regulations No. 30) 575
 sale of narcotics and of proprietary medicines containing (Model law) 145
Aloin, specifications of the U.S.P. too rigid 412
Alum 390
Alumini sulphas 391
American Medical Association, fifty-seventh annual session 342
 Pharmaceutical Association, fifty-fourth annual meeting 480
  program for meeting, September, 1906 399
  Philadelphia Branch, minutes of meetings . . 291, 328, 340, 400, 501, 551
   (Organization meeting) 198
   (Preamble and rules) 246
  Procter Monument Fund 352, 401, 452
Ammonium, benzoate 391
 carbonate 391
 compounds, detection of 380
 salicylate 391
Amyl nitrite, U.S.P. tests, unsatisfactory 413
Antimony oxide 392
Aqua 392
 destillata 392
Army Laboratory, United Ståtes (Diehl) 559
Aromatic waters 282
Arsenic, pharmacopœial tests for (Coblentz) 305, 414
Arseni iodidum 393
Arsenic trioxide 392
Aspirophen 579
Assay, aconite 408
 opium and its preparations (Asher) 262
 pepsin 377
Assay processes, possible danger in 407
 commended 407
Assays, alkaloidal, of the U.S.P., 1900 (Gordin) 453, 458
  use of iodeosin in 377
  volumetric, of the U.S.P. (Arny) 16
Attfield, Professor John. Biographical sketch (Smith) 103
Atomic weights 283

Balm of gilead buds, powdering (Boring) 349
Barutine 138
B-eucain, toxic symptoms following use of 283
Board of Pharmacy, Illinois 185
  North Carolina 184
  Ohio, notice to registered pharmacists and assistant pharmacists 395
Boards of Pharmacy, Joint Conference 486
   program 337
   recommendations 544
  National Association 337
Benzosalin 283
Borax in the United States, production of 136
Botanic gardens, London (Perrédès) 1, 68, 113, 172, 224, 270, 317, 353
Bromides, tests for, in Pharmacopœia 394
 determination of chlorides difficult 414
Bromine, assay of 395
 in the United States, production of 137

Bromo-seltzer, acetanilid in 138
Buying, co-operative, advantages of 494
objections to 495
results of 494

Cactus grandiflorus, chemical examination 490
Calumba root, alkaloids of 579
Caseine, estimation of (Arny and Pratt) 121
Cataplasma kaolina 410
preparation of (Flack) 419
Celluloid, non-combustible 282
Chelsea Physic Garden (Perrédès) 353
Chloral addition compounds 581
Cigars, sale of, by pharmacists (Moore) 374
Cinchona, history and cultivation 137
Java 99, 137
Circulatory displacement in making pharmaceutical preparations 493
Citrocoll 579
Coal-tar industry, jubilee 450
Cocaine in coca leaves, formation of 582
Codex, the new French 135
Collodions, acetone (Beringer) 470
Conference of teaching faculties 400
Consumption, the "Home Sanatorium" treatment of (Pratt) 422
Copper in distilled water, detection of small traces of 282
in the purification of drinking water (Kraemer) 140
Cocoas, examination of commercial 489
Corosuccin 438
Council on pharmacy and chemistry, needs of (Puckner) 584
Counter-prescribing and its relation to public health (Coplin) 341
Cresol, compound solution of (LaWall and Cook) 100, 169
tests for 377

Digestive ferments, a digest of the 377
Diner, Jacob (Personal) 402
Distilled water, detection of small traces of copper in 282
Drugs, outline of A. O. A. C. work on, 1905 44

Early closing movement, the mental necessity of an (England) 505
Education in pharmacy 386
and legislation in pharmacy (Oldberg) 472, 530
Electro-chemistry at Niagara Falls 136
Elements, new (Crookes) 438
Elixir adjuvans 411
aromaticum (Toplis) 332
ferri, quininæ et strychninæ phosphatum (Hughes) 420
simple, as a vehicle in children's prescriptions 373
Eriodictyon, chemical examination of 488
Estoral 439
Examination of pharmaceutical substances 379
Extract, fluid staphisagria; a useless preparation 410

Flora of the Lickey Hills (B. P. C. paper) 435
Flutol 283
Food and Drugs Act 574
Formula bill 130
Franklin, Benjamin, his influence on the progress of the science of medicine in America 214
bi-centenary (1706–1906) 240

Food preservatives in North Dakota, Professor Wiley on (Eccles) 335
Furmurol 579
Fusel oil in spirits, the origin of (Sadtler) 40

Gaultherine 283
Gelsemium, chemical examination 489
Gentiana lutea (illustration), (Perrédès) 116
German naturalists and physicians 577
Glycerin, detection of small quantities of copper and iron in 490
Granular effervescent salts, new method of preparation 377
Grindelia, botanical characters of some California species 488

Historical material, a prescription book used in Raleigh, N. C., during the Civil War 496
Histosan 139
Hydrogen peroxide, preservation by acetanilide (LaWall) 582
sodium or calcium chloride 580

Influence of monotony, the debasing influence of (Thum) 514
Iodine, chloroform solutions of 139

Japanese lac (Stevens) 53
Jasmiflorin 284

Ki-urushi (Japanese lac), (Stevens) 53
Kolatine 284
Kremers, Edward (Personal) 351

Labels on tin, pasting (Toplis) 332
discussion 347
Lac, Japanese (Stevens) 53
Laudanum, Sydenham's 493
LaWall, Charles H. (Personal) 402
Liquor chlori compositus (Shearer) 333
cresolis compositus (La Wall and Cook) 100, 169
Lloyd library (Walker bequest) 452
Lloyd, John Uri (Personal) 351
London botanic gardens (Perrédès) 1, 68, 113, 172, 224, 270, 317, 353

Magnesia, citrate of, effervescent solution of 385
Magnesium carbonate, examination of samples (Du Bois) 416
McIntyre, William (Personal) 152
Medicinal plants, wild, of the United States 152
Medicine and pharmacy, the interdependence of (Eshner) 236
Methylene blue, color test for 490
Metric units, abbreviation for 437
Milk sugar, detection of cane sugar in 380
Mistura glycyrrhizæ composita, preparation of (Bell) 418
Morphine, separation of, from its solution in glycerin (Gordin and Harrison) 464

Names, fancy, the plague of 438
Narcotics, sale of, and of proprietary medicines containing alcohol (Model law) 145
N. A. R. D. Convention 576
National Association of Retail Druggists—How it has benefited the retail pharmacist (Potts) 387
National Formulary 435
New and non-official remedies 499

Nitrates, precipitant for 380
Nitron 139
N. W. D. A. meeting 576

Obituary Notices.—Bley, John 550
Bolton, Joseph P. 550
Brodie, Robert C. 550
Cramer, Henry 550
Dobbins, Edward Tonkin 550
portrait of (Frontispiece to November issue) 503
Ebert, Albert E. 590
Fritzsche, Herman T. 452
Koch, Louis 551
Shryock, Allen 551
Oil, castor, preparation of tasteless 385
Oils, essential, assayed 409
Oldberg, Arne (Personal) 402
Oscar (Personal) 300
Oleoresins, acetone in making 412
Omoral 439
Opium and its preparations, assay (Asher) 262
Otto of rose (Lloyd) 488
Ovogal 439

Patent and proprietary medicines 281
Patent medicine agents or prescription compounders 382
Patent medicines, present status of 382, 383, 384
Pepsin, the activity of 434
Perkin memorial committees 300
Jubilee in America 450, 577
Pharmaceutical Association, American 301
Missouri 301, 351
Ohio 301
Pennsylvania 301
report (LaWall) 365
Pharmaceutical faculties, the American Conference of 48, 337, 541
Pharmacist, functions of the true (Cohen) 325
the duty of, to aid in the elimination of irregular practices (LaWall) 341, 465
the protection that should be offered the, by law (Gabell) 91
Pharmacists, Belgian, decorated 436
the French military 282
Pharmacopœia, American, essential oils (Schimmel & Co.) 253
Austrian 134, 436
Belgian 436
Dutch 281
French 135
German 578
Imperical (Proposed) 578
Spanish 133
United States, Board of Trustees (sixth annual meeting) 302
alkaloidal assay processes (Moerk) 379
assays of (Gordin) 453, 458, 464
business affairs 183
from a physician's standpoint (Thrush) 30
from point of view of analyst and as a legal standard (Leffmann) 77
discussion 99
chemicals, inorganic (Arny) 10
of the U.S.P. (Coblentz) 303, 387
(Schimpf) 18

Pharmacopœia, United States, discussion on (Remington) 150, 374
doses 376
doses in (Wilbert) 87
essential oils (Schimmel & Co.) 253
notes on the new (Searby) 203
popularizing, with physicians 132
resumé of criticisms (Wilbert) 403
Spanish edition 133
the physician and the 378
Pharmacy and medicine, the interdependence of (Eshner) 236
Phenol, tests for 377
Phlox ovata, root structure (Holm) 553

PHILADELPHIA COLLEGE OF PHARMACY.
Alumni Association 299, 346
annual meeting 248
commencement, the eighty-fifth 293
committee on necrology, report of 549
deceased members 549
honorary members elected 548
minutes of board of trustees 101, 248, 397, 548
minutes of December, 1905, meeting 101
minutes of June meeting 396
minutes of semi-annual meeting 548
presentation of journals (McIntyre) 397
pharmaceutical meetings 98, 149, 201, 346, 519, 588
preliminary education 186
scholarship by E. T. Dobbins 397
sermon, Baccalaureate 299
supper, faculty 299

Plant constituents, collection of 402
mutation, studies in (Slade) 311
Potassium, detection of 380
Preparations, popularizing standard 384
Preservation of medicinal and chemical properties 138
Preservatives in food, use of (Wiley) 153
discussion on 201
Procter memorial (Kraemer) 420
circular by committee of A.Ph.A. 285
Procter monument fund 352, 401, 452
letter from Professor Attfield 448
Progress in pharmacy (Wilbert) 129, 280, 428, 574
Proponal 139
Proprietaries, prescribing of 131
Proprietary medicine label bills 130
medicines containing alcohol, sale of narcotics and of (Model law) . 145
remedies in Austria 578
Proprietaries, sale of intoxicating 131
Protosal 139
Public Health Defense League 577
Pure food bill, the national (text of) 430, 440, 574
Purgier Konfect 580

Quinine acetyl salicylate 580

Redsecker, J. H. (Personal) 152
Remington, Joseph P. (Personal) 300
Resin, phosphorated, determination of phosphorus in 490
Rest and recreation as a physical necessity (Flick) 519

REVIEWS, BOOK:

Analytical chemistry (Muter) 197
Annales de l'institut colonial de Marseille 449
Annual laboratory report of the Smith, Kline & French company . . 452
Bacteria in relation to plant diseases (Smith) 96
Commentary on the eighth revision of the U. S. Pharmacopœia (Francis) 451
Electro-chemistry of organic compounds (Löb) 192
Elements of applied microscopy (Winslow) 238
Elements of physical chemistry (Morgan) 191
Follies of science at the court of Rudolph II (Bolton) 43
Grundzüge der chemischen Pflanzen-Untersuchung (Rosenthaler) . 239
Lehrbuch der Intoxikationen (Kobert) 448
Materia medica, pharmcy and therapeutics (Potter) 196
Materia medica (Squibb's) 291
(Stevens) 197
Methods of organic analysis (Sherman) 238
Microscopy of vegetable foods (Winton) 237
The modern materia medica (*The Druggists' Circular*) 451
National formulary 351
New and non-official remedies (council on pharmacy and chemistry of the American Medical Association) 499
Neue Arzneimittel organischer Natur (Rosenthaler) 198
Practice of pharmacy (Remington) 95
Proceedings of the A. Ph. A. 351
Progress in alkaloidal chemistry (Gordin) 452
Qualitative chemical analysis (Schimpf) 193
Quiz-compends 239
Select methods in food analysis (Leffmann and Beam) 195
Text-book of chemistry (Jones) 198
(Sadtler and Coblentz) 546
on medical and pharmaceutical chemistry (Bartley) 198
on pharmacy (Caspari) 151
of physiological chemistry (Long) 199
Whys in pharmacy (Ruddiman) 194
Rheum officinale (Illustration) 356
palmatum (Illustration) 356
Rhubarb, purgative principles of 580
Ruellia ciliosa, root structure (Holm) 553
Rusby, H. H. (Personal) 152, 300, 452

Sadtler, Samuel P. (Personal) 52
Salene 284
Salicin versus salicylates 439
Salol, acetyl- 284
Sambunigrin 439
Santyl 140
Scholarship and prizes, the Fairchild 52
Searby, William M. (Personal) 301
Secret remedies, exclusion of, from North Dakota 438
The British Medical Association and 437
Self-medication, limitations of (Neilson) 340
Shorter hours and a day for rest 501, 503–527
Show-windows in suburban sections 381
Sidonal, new 439
Silver compounds, bactericidal action of 579
Silver iodide, nascent (Wilbert) 64
Soda fountain 386
Sodium phosphate, examination of samples (Shomo) 416

Solution of cresol (LaWall and Cook) 100, 169
lead subacetate, preparation of (Thompson) 416
of hydrogen peroxide containing acetanilide (LaWall) 582
Somnos 581
Sophol 583
Spigelia marilandica, root structure (Holm) 551
Spirit of nitrous ether 376
peppermint, preparation 373
Stovain, poisoning by 283
Strophanthus and strophanthin 434
Strychnine, oxidation compounds of 438
Styracol 440
Sulphates, volumetric determination of 380
Sulphopyrine 440
Sunday closing and shorter hours (Cuthbert) 503
discussion 501, 503, 527
practical experience with (Campbell) 518
(Cliffe) 517
(Conwell) 518
(Redsecker) 523
(Weidemann) 516
rest as a religious institution (Steele) 508
Suppositories, discussion on making 347
glycerinated gelatin, preparation of (Scatchard) 419
preparation (Foster) 417
Suprarenal gland, preparation of solutions of the active principle 489
Syrup of wild cherry, U.S.P., 1900 (England) 267

Takamine, Jokichi (Personal) 300
Toxicatin 284
Theophorin 440
Theobrominlithium 284
Thiobromose 284
Theses on chemical subjects, abstracts of (Ehman) 333, 416
pharmaceutical subjects, abstracts of (Cook) 417
Thymol iodide, preparation of 378
Tincture of iodine, preparation 374
nux vomica, U.S.P., 1900 (England) 527
opium, a comparison of the seventh and eighth U.S.P. requirements for morphine 491
Tinctures from fluid extracts 373
Tooth-pastes, formulas for (Blair) 372
Tschirch, A., biographical sketch of (Stevens) 38
Tulase 582
Tyree's antiseptic powder 582

Veratrum viride (Illustration), (Perrédès) 117
Vesipyrin 284

Water, ammonia, examination of samples (Thorley) 416
purification of drinking 582
Waters, aromatic 282
the aromatic medicated, preparation of (Earl) 418
Wellcome Historical Exhibition 300
Wiegand scholarship (Committee) 152
Wild cherry, syrup of, U.S.P., 1900 (England) 267
discussion 348
Women as dispensers 495

Zymphene 140

AMERICAN JOURNAL OF PHARMACY

PUBLISHED BY AUTHORITY OF THE

Philadelphia College of Pharmacy

VOL. 78 DECEMBER, 1906 No. 12.

CONTENTS.

The Root-Structure of Spigelia Marilandica L., Phlox Ovata L. and Ruellia Ciliosa Pursh. By Theodore Holm, Ph.D., Brookland, D. C. 553
United States Army Laboratory. By Prof. C. Lewis Diehl 559
Progress in Pharmacy. By M. I. Wilbert, Ph.M., Apothecary at the German Hospital, Philadelphia 574
Solution of Hydrogen Peroxide Containing Acetanilide. By Prof. Charles H. LaWall 582
The Needs of the Council. By Prof. W. A. Puckner, Secretary of the Council on Pharmacy and Chemistry of the American Medical Association 584
Pharmaceutical Meeting of the Philadelphia College of Pharmacy 588
Obituary: Albert E. Ebert. 590
Index 591

Price, $3.00 per Annum, in advance. Issued in Monthly numbers of not less than 48 pages

SINGLE NUMBERS, 25 CENTS

Address all papers for publication, etc., to the Editor.

All communications relating to subscriptions, advertisements, etc., to the American Journal of Pharmacy, 145 North Tenth Street, Philadelphia, Pa.

SECRETARIES OF BOARDS OF PHARMACY.

State.	Name of Secretary.	Address.
Alabama,	E. P. Galt,	Selma.
Arizona,	A. G. Hulett,	Phenix.
Arkansas,	J. W. Beidleman,	Little Rock.
California,	C. B. Whilden,	Alameda.
Colorado,	W. L. Shockey,	Cripple Creek.
Connecticut,	A. L. Dickinson,	Danbury.
Delaware,	W. F. Dunn,	Smyrna.
District of Columbia,	H. A. Johnston,	Washington.
Florida,	E. Berger,	Tampa.
Georgia,	Geo. F. Payne,	Atlanta.
Idaho,	L. W. Smith,	Boise.
Illinois,	F. C. Dodds,	Springfield.
Indiana,	A. F. Sala,	Winchester.
Indian Territory,	H. D. Knisely,	Checotah.
Iowa,	C. W. Phillips,	Des Moines.
Kansas,	W. E. Sherriff,	Ellsworth.
Kentucky,	J. W. Gayle,	Frankfort.
Louisiana,	F. C. Godbold,	New Orleans.
Maine,	F. H. Wilson,	Brunswick.
Maryland,	John A. Davis,	Baltimore.
Massachusetts,	Wm. F. Sawyer,	Boston.
Michigan,	A. H. Webber,	Cadillac.
Minnesota,	Chas. J. Moos,	Minneapolis.
Mississippi,	S. L. Caine,	Columbus.
Missouri,	Paul L. Hess,	Kansas City.
Montana,	S. J. Coffee,	Missoula.
Nebraska,	D. J. Fink,	Holdredge.
Nevada,	F. J. Steinmetz,	Carson City.
New Hampshire,	G. F. Underhill,	Concord.
New Jersey,	H. A. Jorden,	Bridgeton.
New Mexico,	A. J. Fischer,	Santa Fe.
New York, E. Branch,	Joseph Weinstein,	New York.
" " M. "	W. L. Bradt,	Albany.
" " W. "	George Reimann,	Buffalo.
North Carolina,	F. W. Hancock,	Oxford.
North Dakota,	W. S. Parker,	Lisbon.
Ohio,	W. R. Ogier,	Columbus.
Oklahoma,	F. B. Lillie,	Guthrie.
Oregon,	Miss Kittie W. Harbord,	Salem.
Pennsylvania,	C. T George,	Harrisburg.
Rhode Island,	J. E. Brennan,	Pawtucket.
South Carolina,	F. M. Smith,	Charleston.
South Dakota,	E. C. Bent,	Dell Rapids.
Tennessee,	Ira B. Clark,	Nashville.
Utah,	C. H. McCoy,	Salt Lake.
Vermont,	J. G. Bellrose,	Burlington.
Virginia,	T. A. Miller,	Richmond.
Washington,	P. Jensen,	Tacoma.
West Virginia,	A. Walker,	Sutton.
Wisconsin,	H. G. Ruenzel,	Milwaukee.

PHILADELPHIA COLLEGE OF PHARMACY

As the result of a meeting held on February 23, 1821, in the historic Carpenters' Hall, within whose walls assembled the first Continental Congress, the Philadelphia College of Pharmacy was organized, and received its charter from the State of Pennsylvania in 1822. It is thus the oldest College of Pharmacy in the United States.

Since the establishment of the institution, 18,114 students have matriculated, and the diploma of the College has been conferred upon 5,391 persons, representing every State in the Union, as well as Canada, Cuba, Central and South America, and various parts of Europe, Asia and Africa.

Educational Requirements

A diploma is now a prerequisite. The pharmacy laws of Pennsylvania and New York require that the responsible head of a drug-store shall possess a diploma from a recognized college or school of pharmacy. Those who have adopted pharmacy as a calling must therefore look forward in the future to the necessity for acquiring a *systematic pharmaceutical education.*

In order to pursue the course of studies proposed in the curriculum of the college, the student must be at least eighteen years of age and possess a fair preliminary education. The minimum standard for admission to the course leading up to a degree of the College is now the equivalent of the completed first year's instruction in an approved high school or academy of equal standing.

Scholarships

There have been established for deserving students the *Peter Williamson*, the *Robert Bridges*, the *John M. Maisch*, the *Henry and W. P. Troth*, the *Thomas H. Powers*, and the *Keasbey & Mattison Scholarships*, each of which entitles one or more students to free tickets to the courses of lectures for one year. Of these, the last two mentioned are awarded after competitive examination.

The Alumni Association of the College has founded the *Edward C. Jones Scholarship*, which shall entitle the holder to the privilege of taking the required laboratory courses during one college term.

Free Scholarships. The College has offered for the year 1906 one free scholarship for the full three years' course to each of the following schools of Philadelphia: *The Central High School, the Girls' Normal School, the Girls' High School, the Central Manual Training School, and the Northeast Manual Training School*, on the condition that each student to whom one of the foregoing scholarships is to be awarded first signs an agreement to follow the study and practice of Pharmacy for a profession.

Further information may be obtained from the Registrar of the College, 145 North Tenth Street.

American Journal of Pharmacy, 78, 1906

Restricted Book

The borrowing of this book is subject to the restriction as checked below.

1. May be used only in the library, not to be withdrawn at any time.
2. May only be withdrawn from 4 P.M. until 9 A.M. of the following day.
3. May be borrowed for a period of 24 hours.
4. May be borrowed for a period of 7 days.

ONTARIO COLLEGE OF PHARMACY